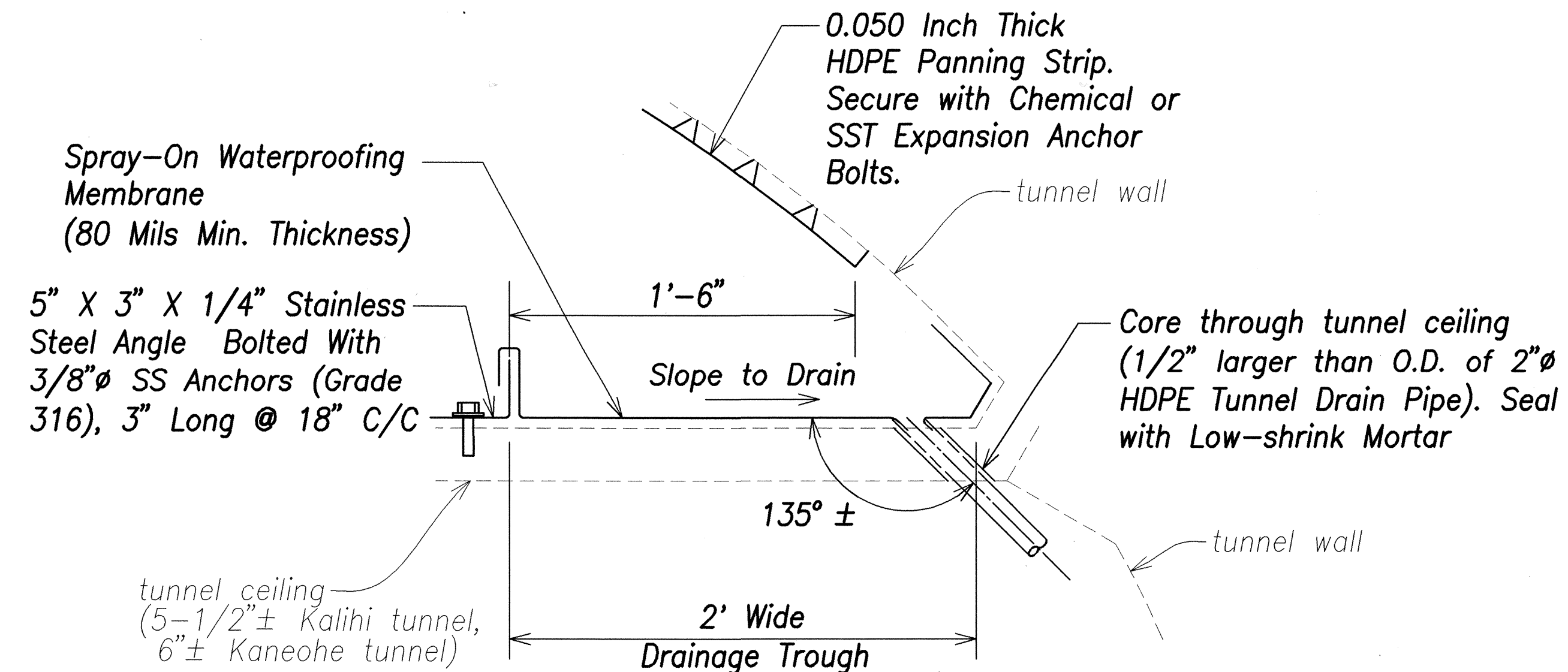
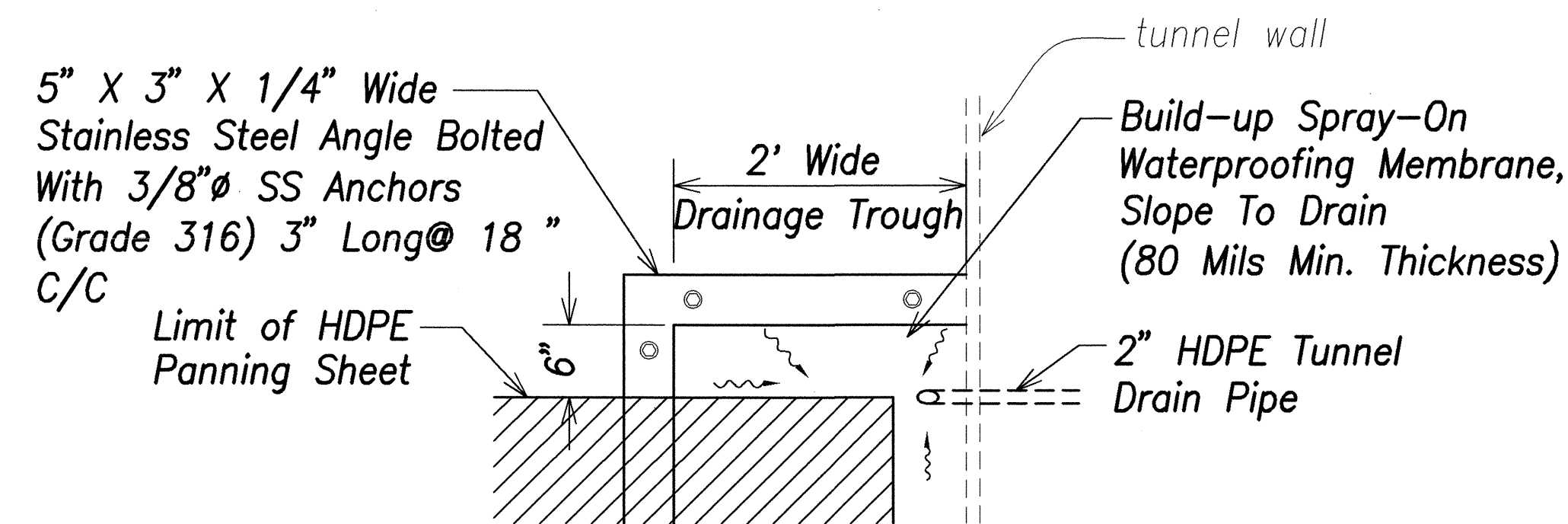


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-063-1(22)	2003	17	69

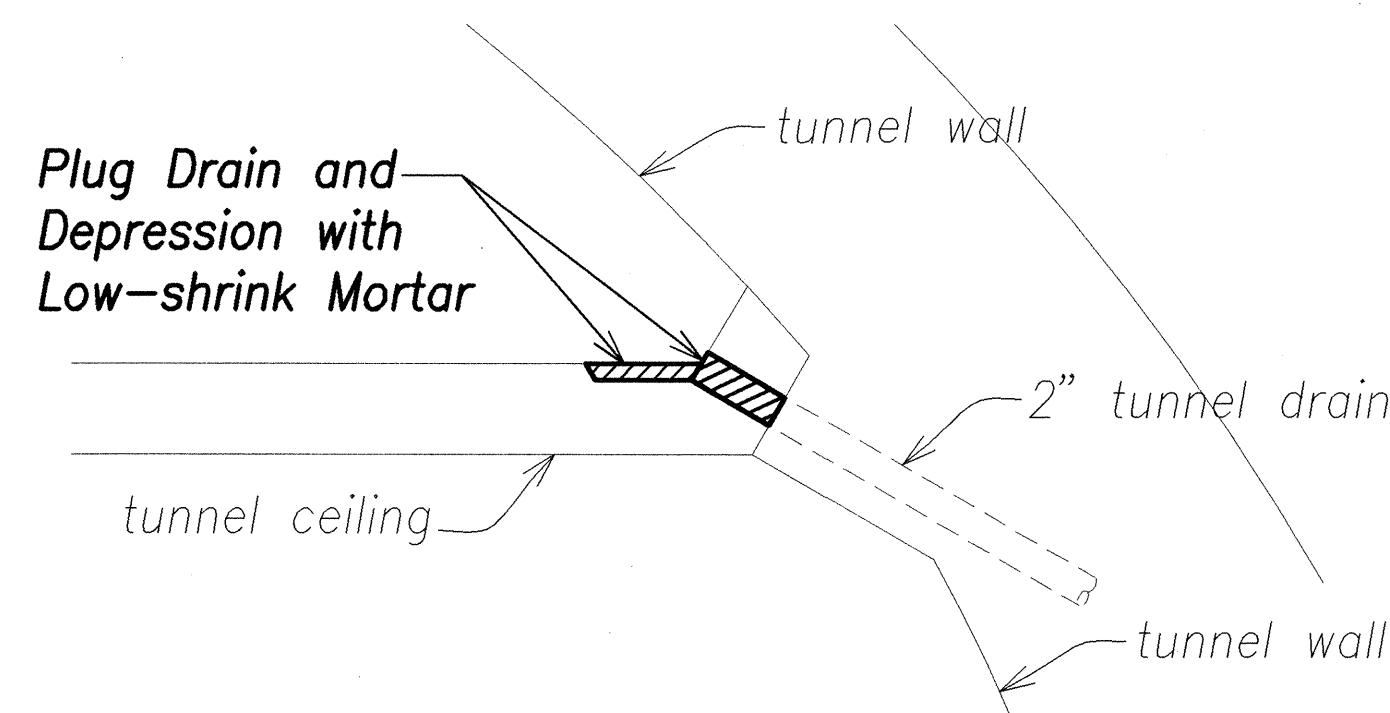


SECTION  
Scale: 1" = 6"

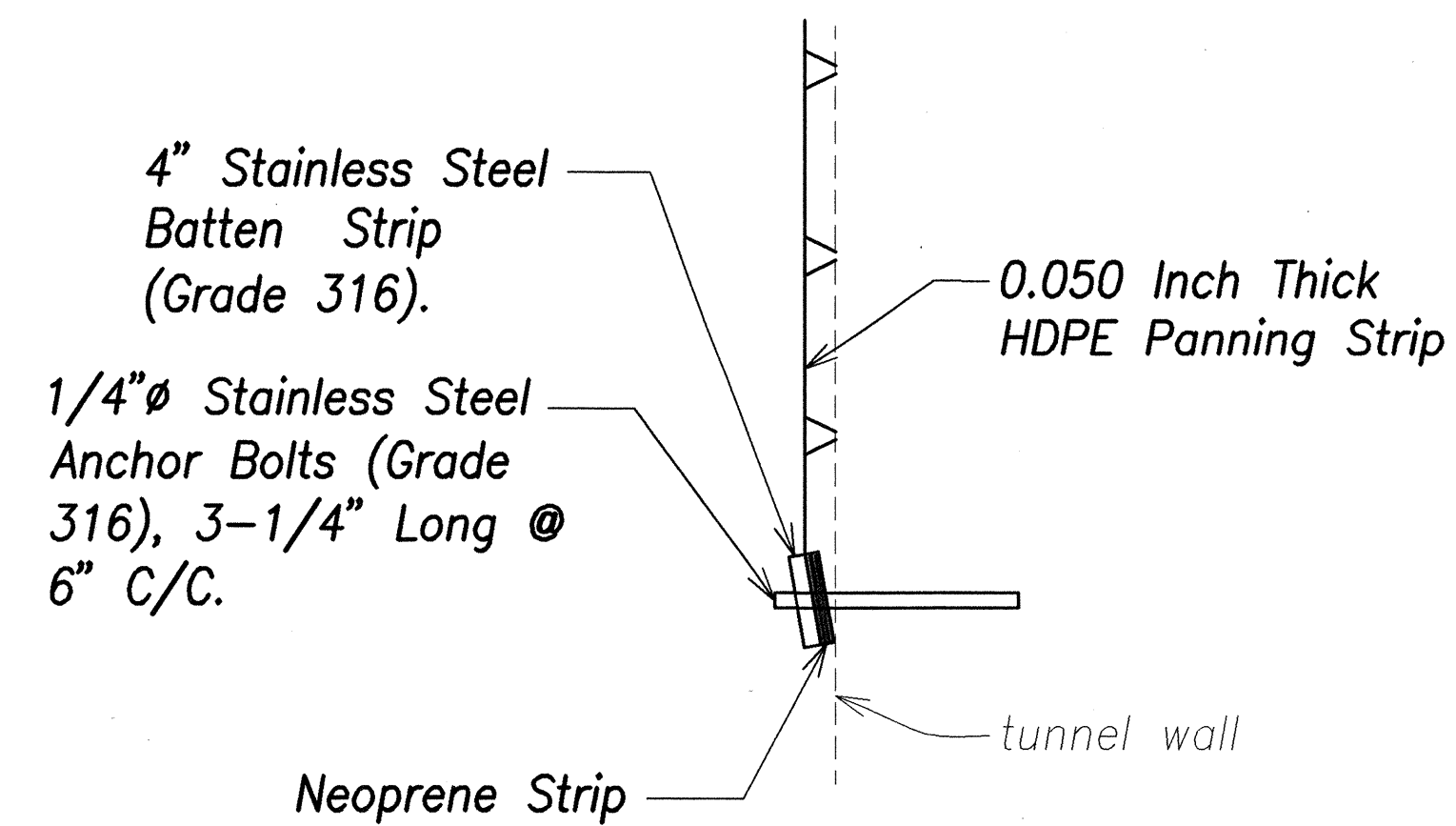


PLAN  
Scale: 1" = 1'-0"

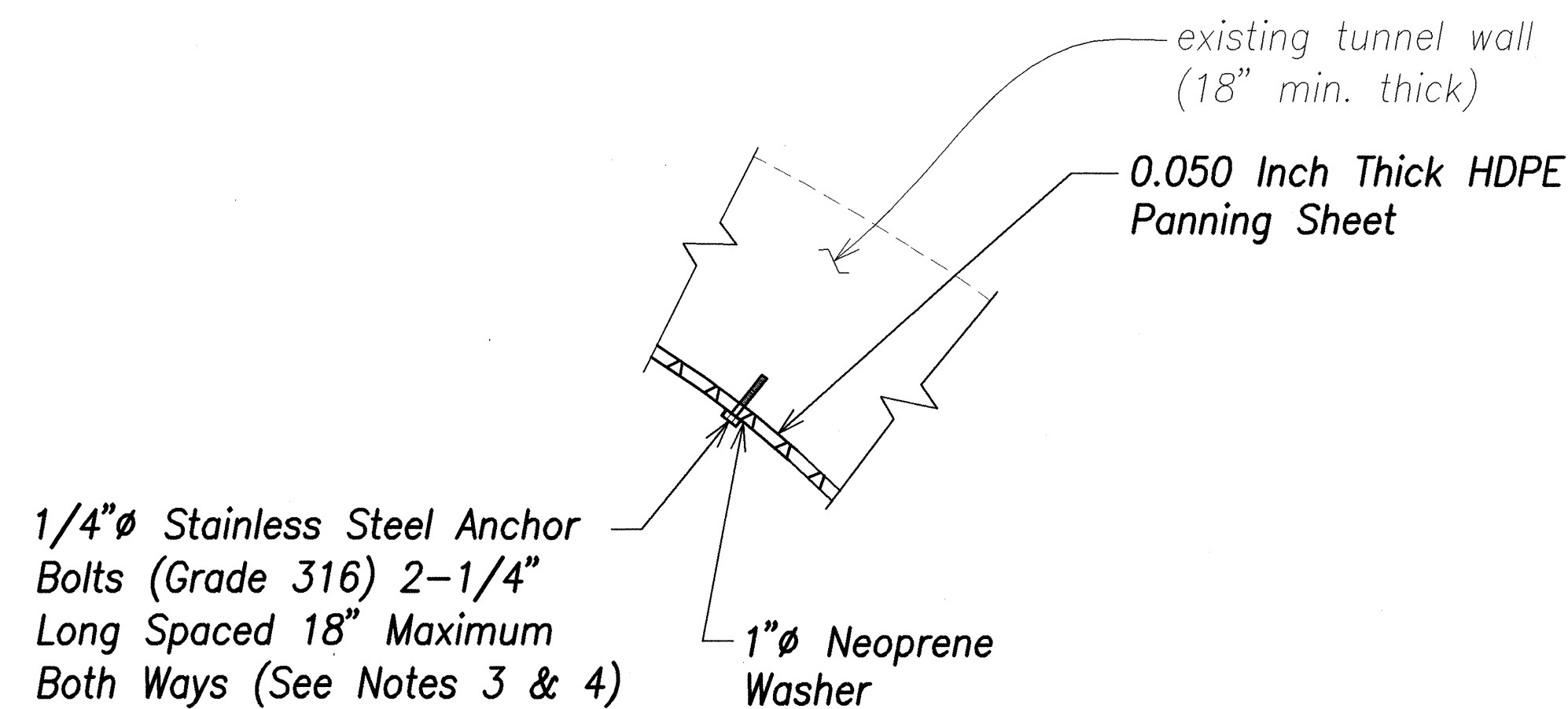
### AIR PLENUM DRAINAGE TROUGH



TUNNEL DRAIN DEMOLITION  
Scale: Not to Scale



DETAIL OF PANNING  
VERTICAL EDGE BATTENS  
Not to Scale

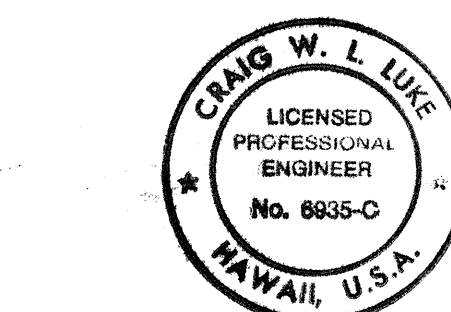
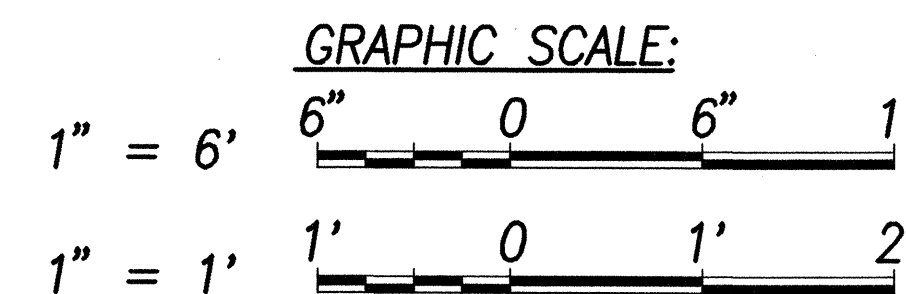


PANNING DETAIL  
Not to Scale

### Panning Installation Notes:

- Contractor shall thoroughly clean all surfaces where HDPE Panning will be installed.
- Calcium Carbonate deposits (Stalagmites and Stalactites) shall be removed and cracks/leaks properly cleaned as directed by the Engineer. Cracks/leaks that are not panned off shall be sealed as directed by the Engineer.
- Bolt spacing across the panning panel width should begin approximately 4" from the panel edge or approximately 1/2 way within the panel overlap area.
- Bolt spacing along the panning height width should begin approximately 4" from the top of the panel and extend downward with a bolt installed a maximum of 4" from the panel bottom.
- 6" min. vertical overlap between sheets. Horizontal overlaps are not permitted. Overlapping sheets shall be sealed with adhesive sealant compatible with panning material.
- Contractor shall verify and protect all plumbing, electrical, and mechanical items prior to applying waterproof membrane.
- Exposed reinforcing bars should be cleaned to remove all traces of rust.

SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	



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Signature: [Signature] April 30, 2004  
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

### AIR PLENUM DRAINAGE DETAILS

LIKELIKE HIGHWAY

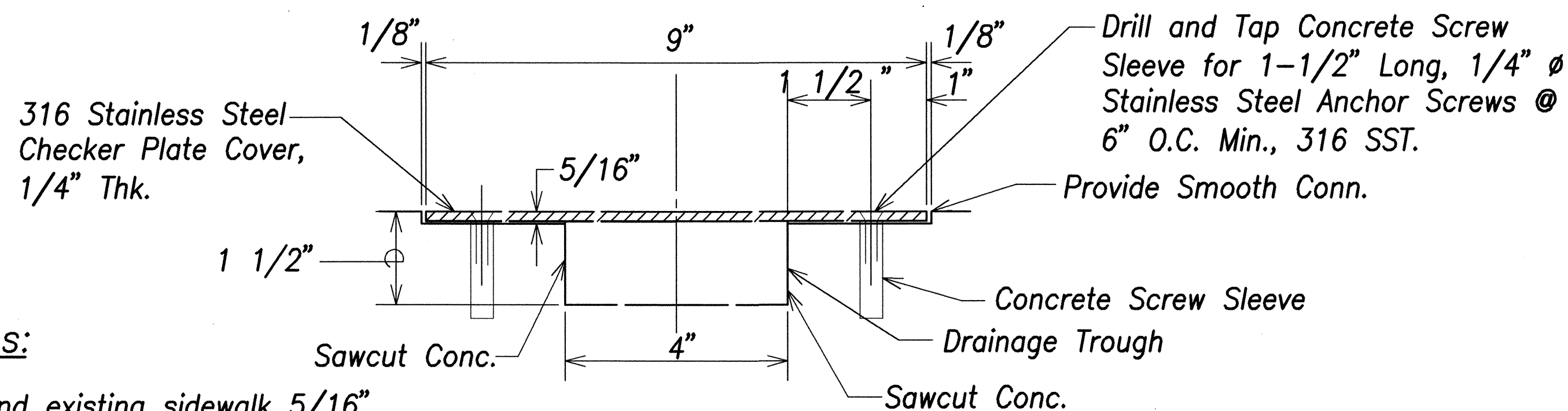
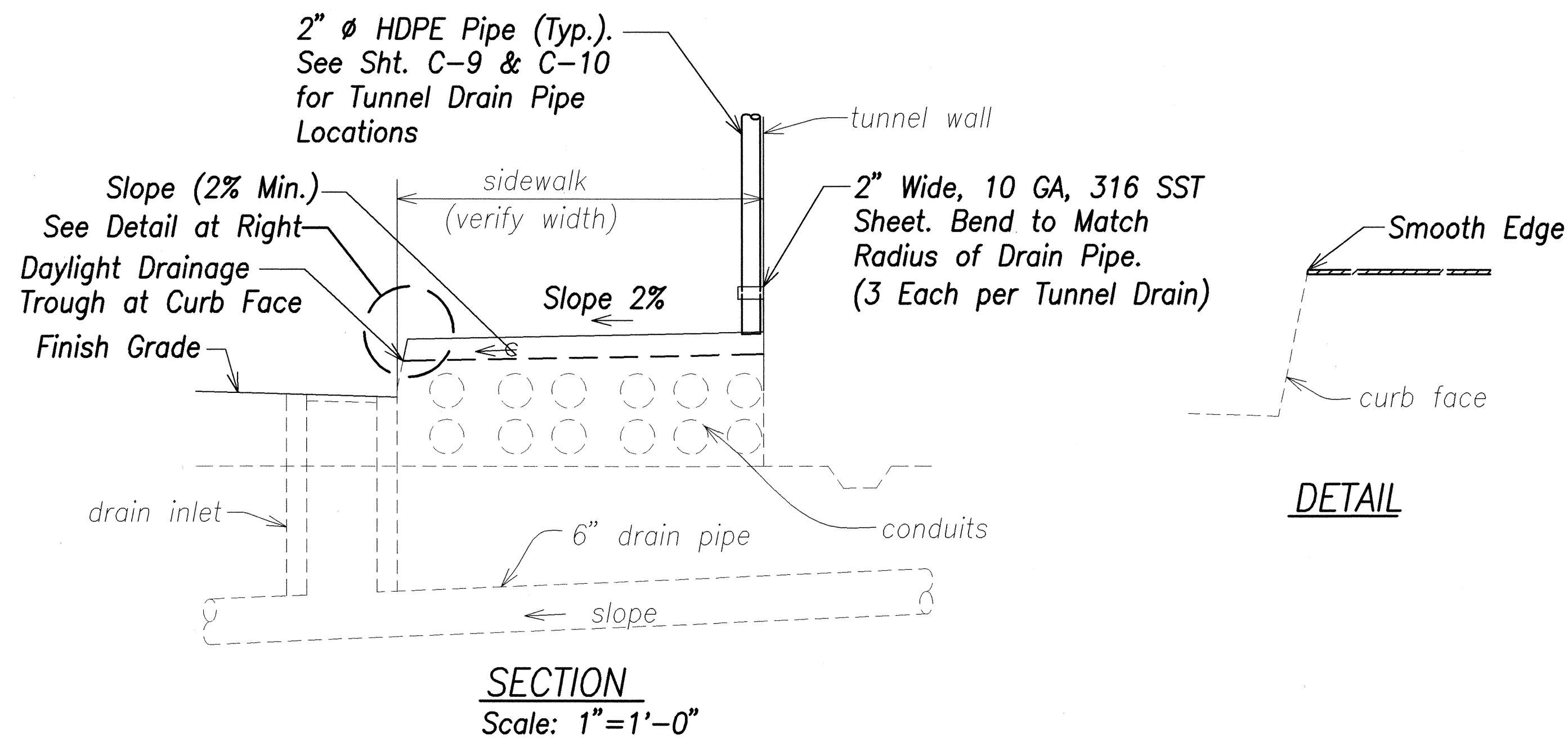
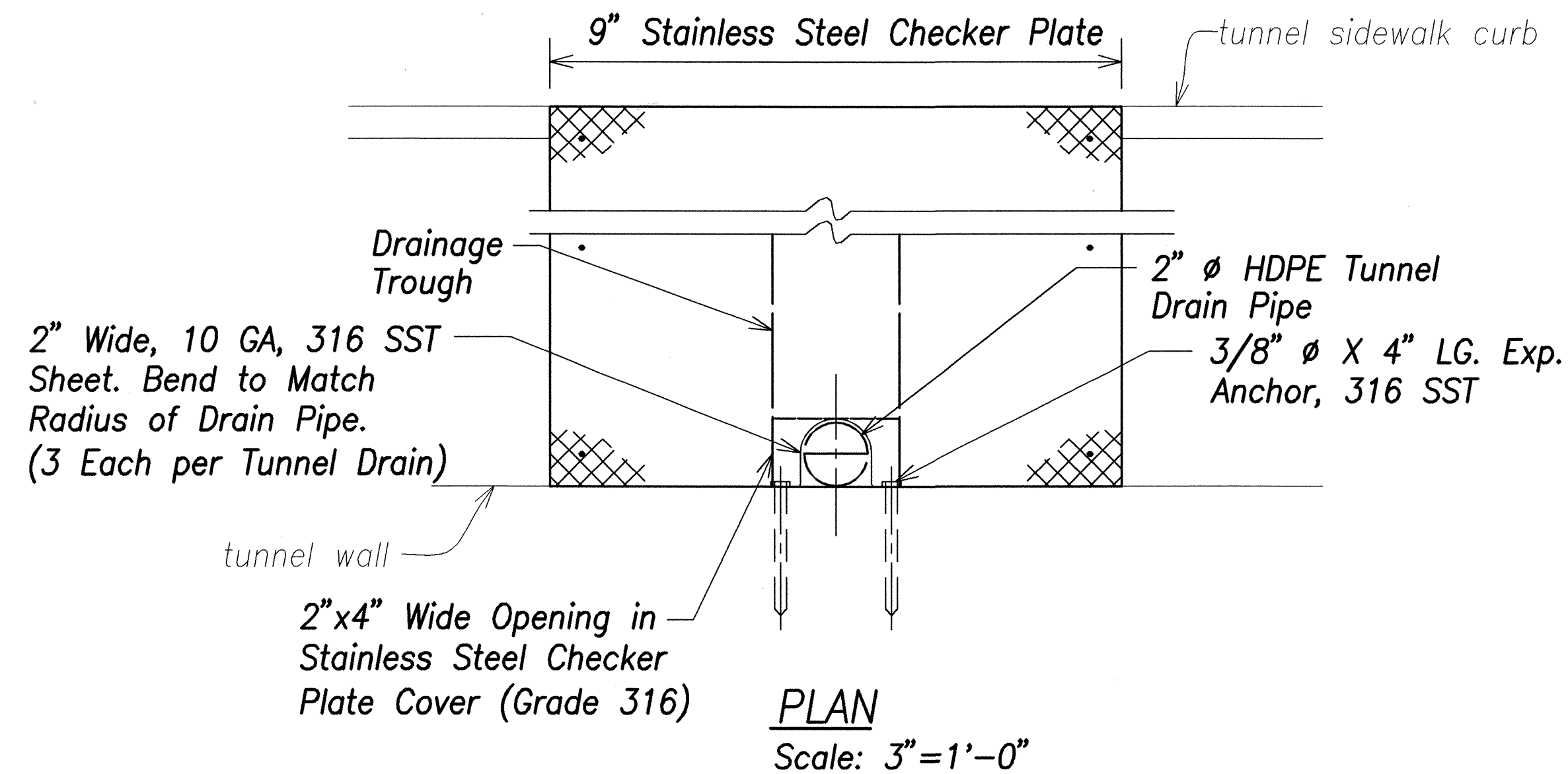
Wilson Tunnel Improvements

Leak and Crack Remediation

F. A. Project No. STP-063-1(22)

Scale: As Shown Date: April 24, 2003

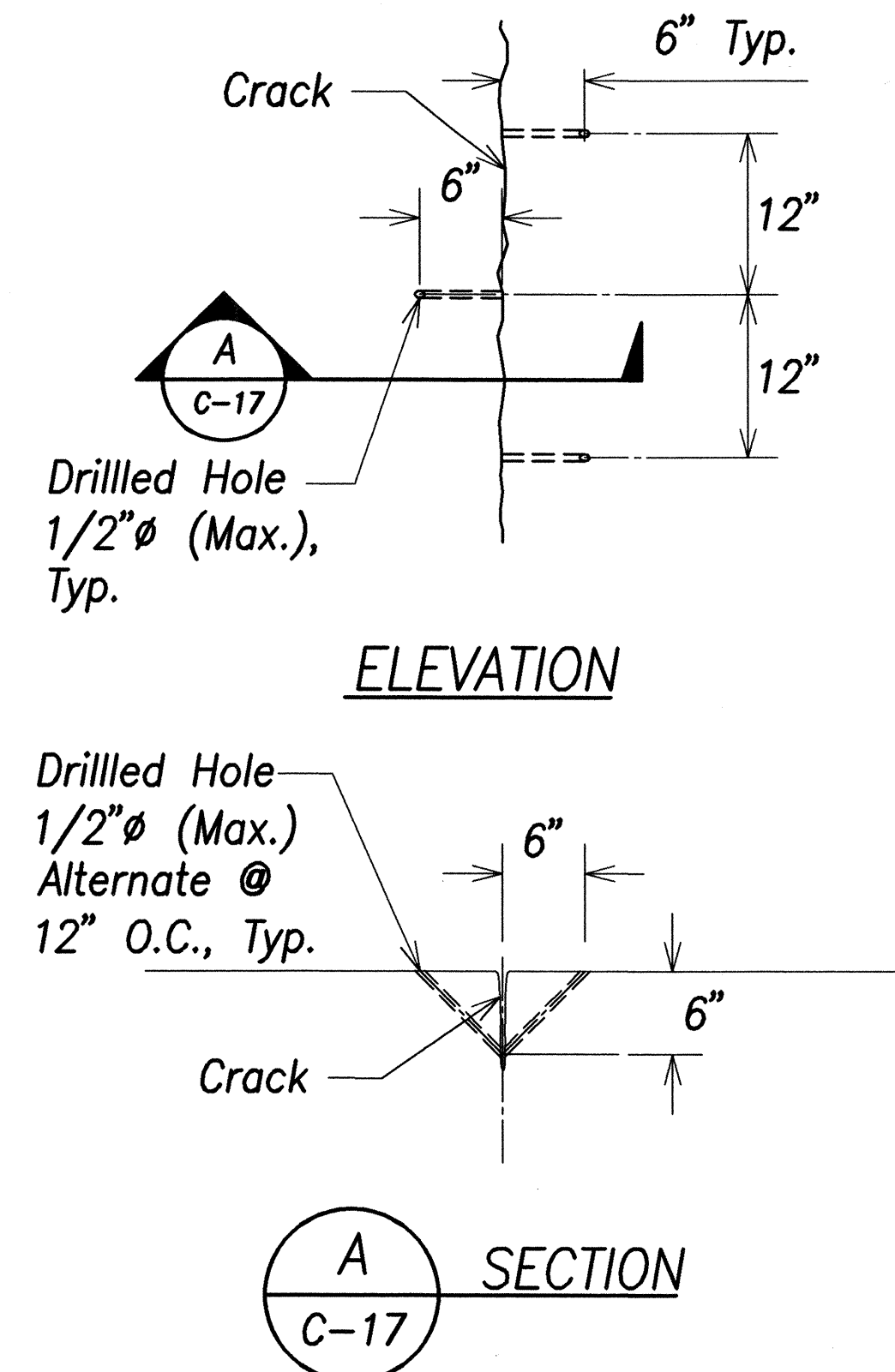
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-063-1(22)	2003	18	69



#### Notes:

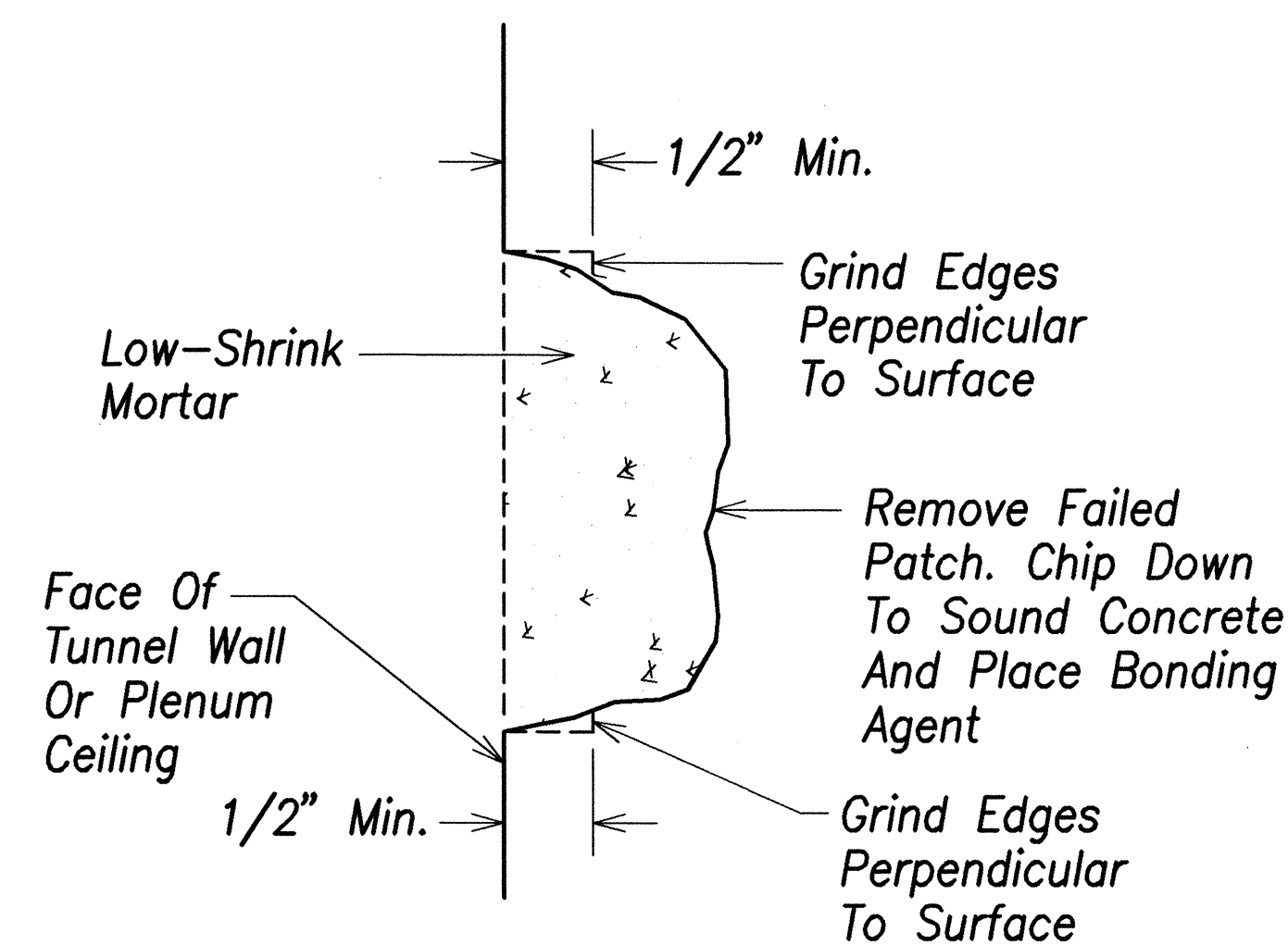
- Grind existing sidewalk 5/16" down, 9 1/4" wide strip (full width of sidewalk).
- Cut-out and remove concrete 1 1/2" deep by 4" wide for drainage trough.
- Cut reinforcing bars as necessary.

#### SIDEWALK DRAINAGE TROUGH



#### POLYURETHANE GROUT LEAK SEALING

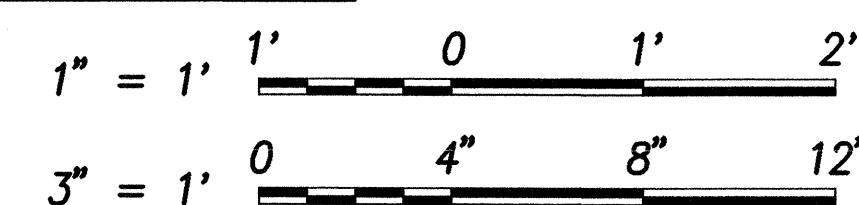
Scale: 1"=1'-0"



#### PATCH FAILURE/SPALL REPAIR ALONG TUNNEL WALLS/PLENUM CEILING

Not To Scale

#### GRAPHIC SCALES:

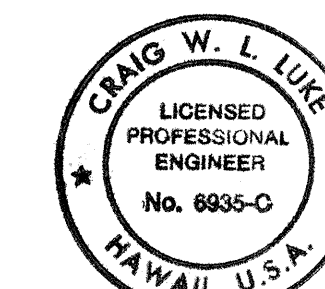


#### Polyurethane Grout Leak Sealing Notes:

- Clean crack, remove debris and efflorescence to clean and hard surface.
- Drill 1/2" (max.) holes, 12" o.c. directly into the crack at an angle intersecting the crack approximately 6 inches behind the face of the concrete. Drilled holes shall be alternating left and right of the crack in a "stitching" pattern. If rebar is encountered, re-drill hole as close as possible to the planned hole.
- Flush drilled holes with water to clean hole and verify adequacy of the connection between the holes and return through the crack to the concrete surface.
- Inject grout into the lowest positioned hole first. Grout drilled holes with Polyurethane grout until return is seen in the crack or the adjacent hole. If cracks are difficult to fill due to excessive width, stop grouting and allow grout to set. After grout sets, resume grouting procedure. Re-drill new holes as required.
- Inflow of water from cracks that were previously dry shall be grouted with a waterproof grout if inflow is determined to be unacceptable by the Engineer. Contractor shall prepare surface and install waterproof grout per manufacturers recommendation.

#### Patch Failure/Spall Repair Notes:

- Spall greater than 1/2" in depth shall be sandblasted to provide clean surface and coat with epoxy bonding compound.
- Fill prepared area with low-shrink mortar matching the finish on the adjacent concrete.



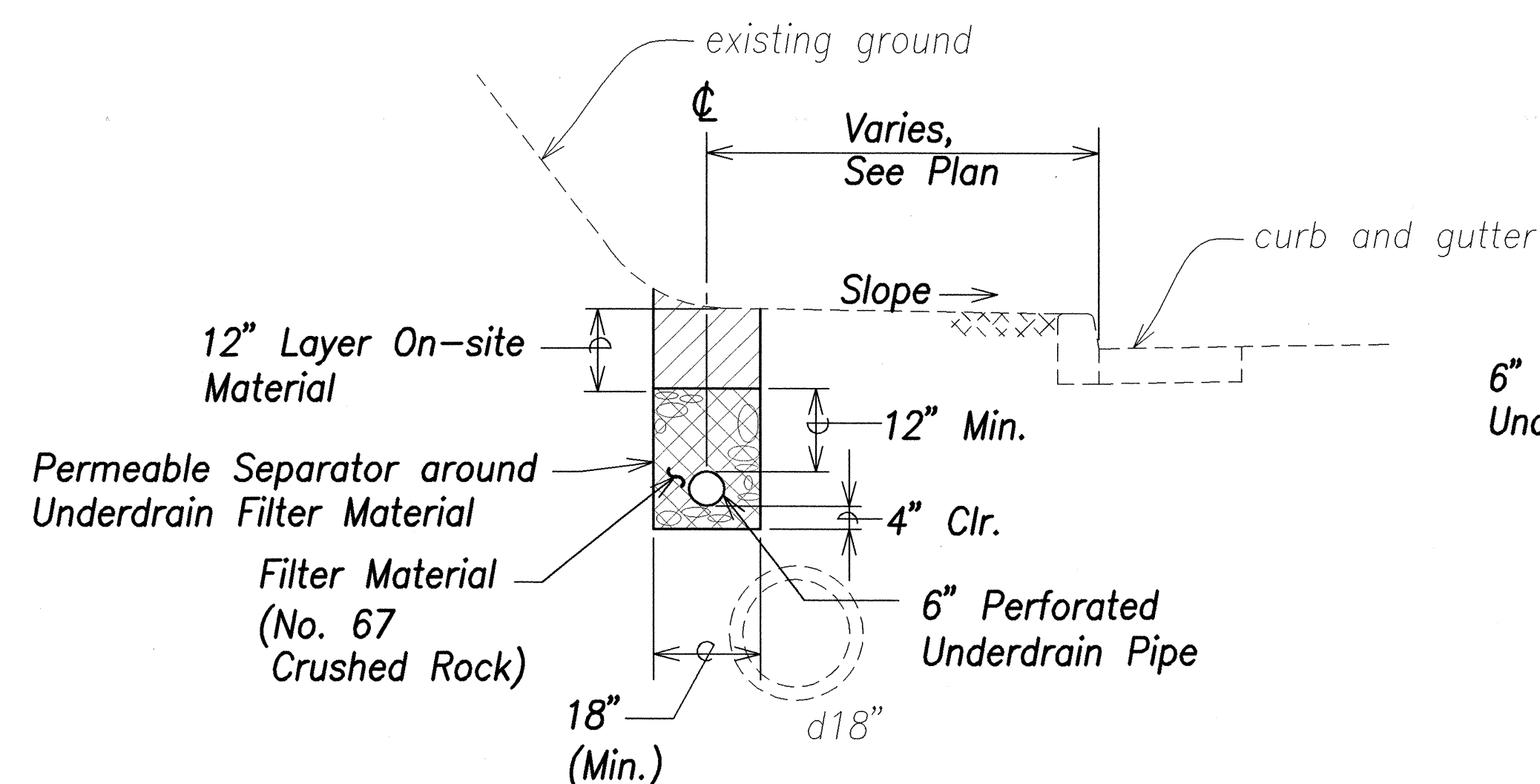
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Signature: [Signature] April 30, 2004  
EXPIRATION DATE OF THE LICENSE

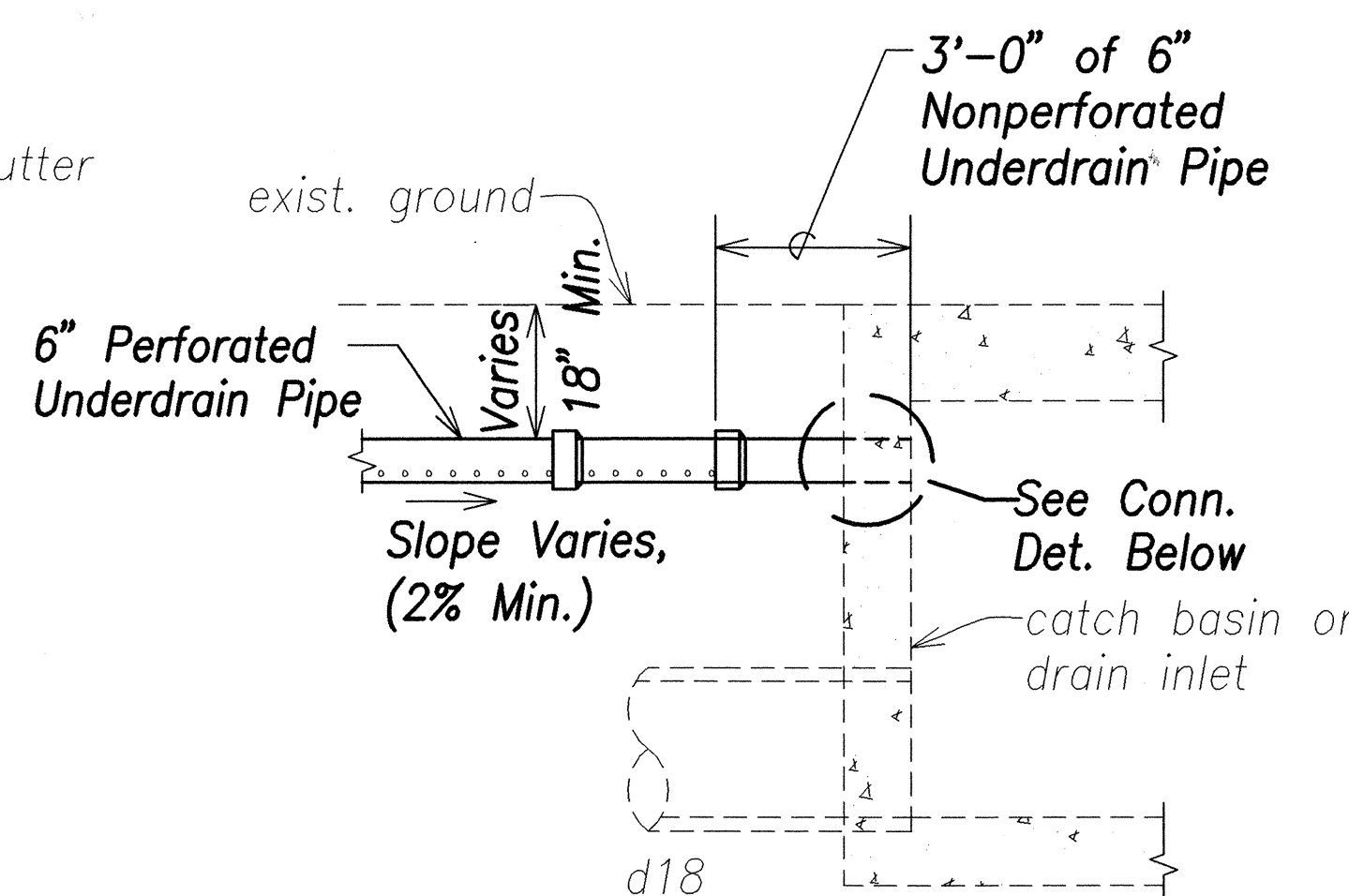
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
<b>TUNNEL DRAINAGE DETAILS</b>	
LIKELIKE HIGHWAY	
Wilson Tunnel Improvements	
Leak and Crack Remediation	
F. A. Project No. STP-063-1(22)	Date: April 24, 2003
Scale: As Shown	
SHEET No. C-17 OF 30 SHEETS	



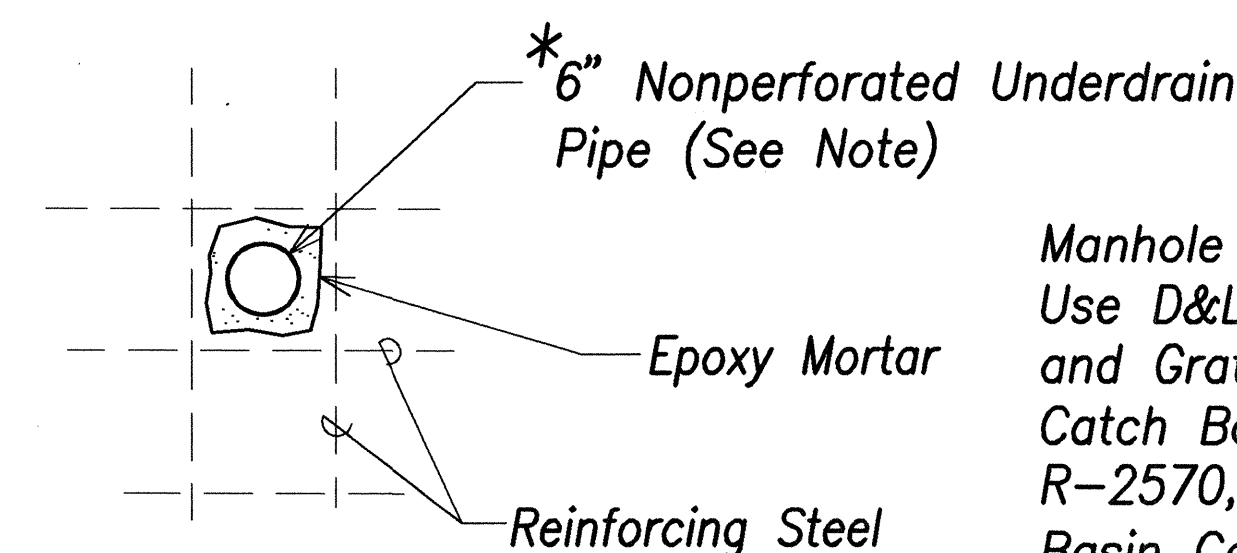
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-063-1(22)	2003	20	69



**UNDERDRAIN SECTION**  
Scale: 1"=2'



**SECTION**  
Not to Scale

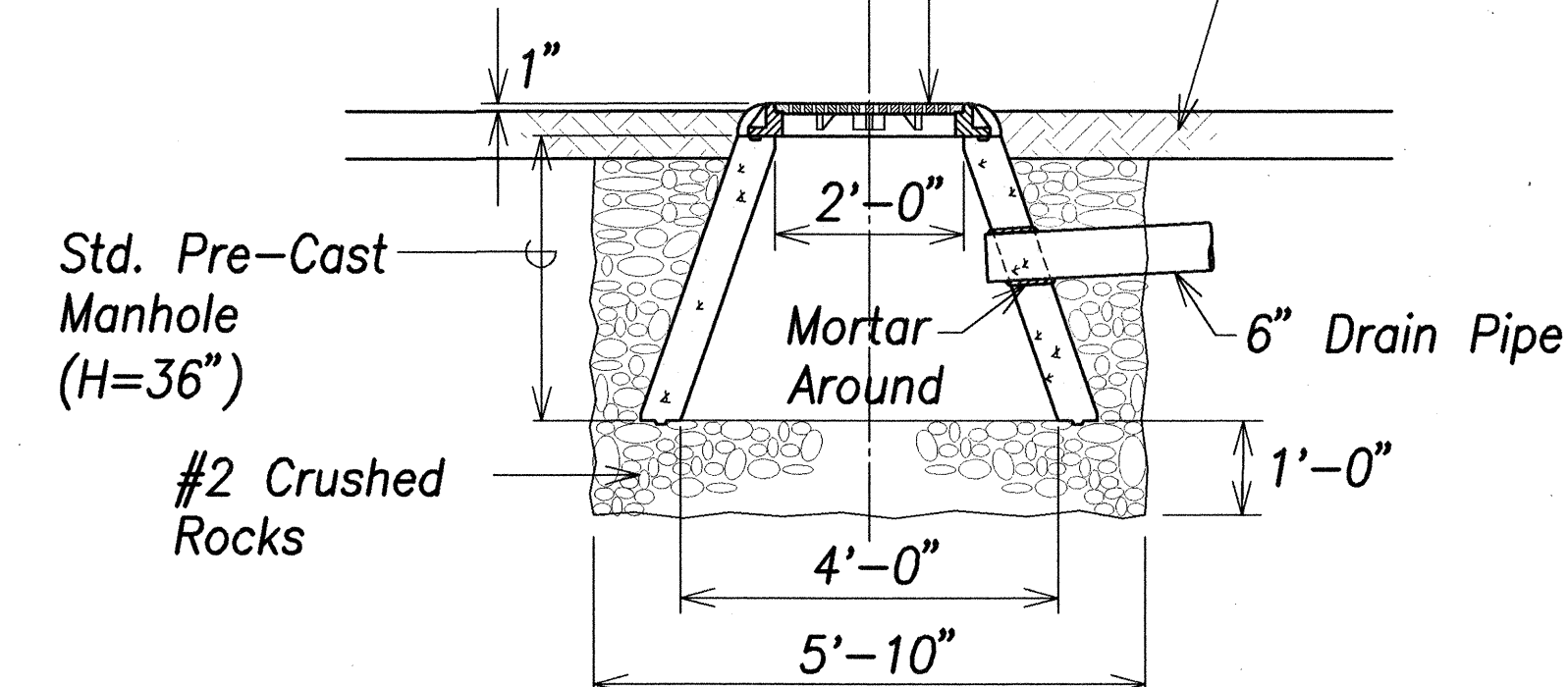


**DETAIL**

**Notes:**

1. The exact invert location of the underdrain connection shall be adjusted to pass between the reinforcing steel.
2. 6" nonperforated underdrain pipe at drainage structure connection shall be incidental to the cost of other contract items.

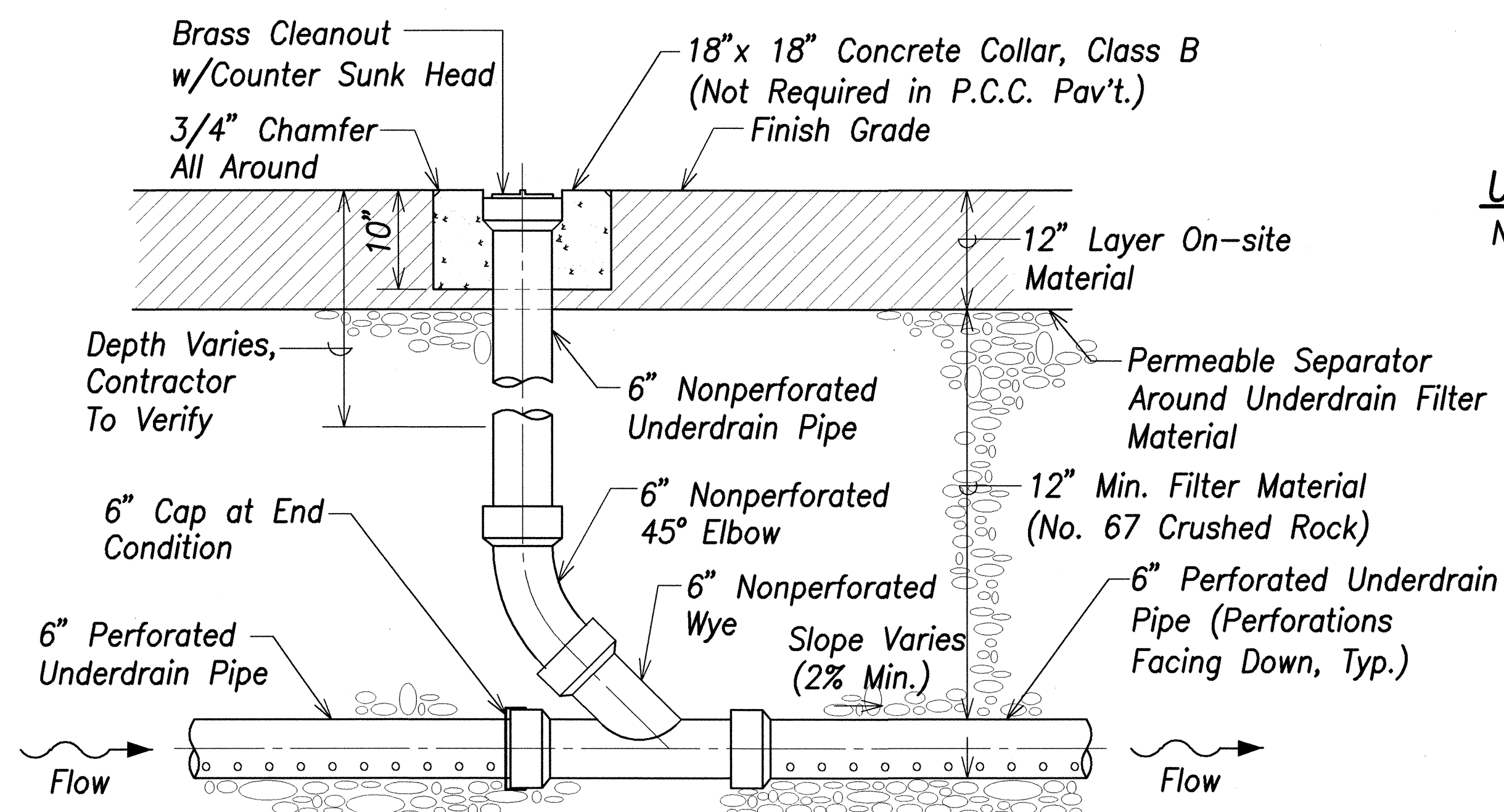
Manhole Ring And Grated Cover. Use D&L Supply Manhole Ring and Grate C-2669, Neenah Catch Basin Frame and Grate R-2570, East Jordan Catch Basin Cover/Base 3510, or Approved Equal.



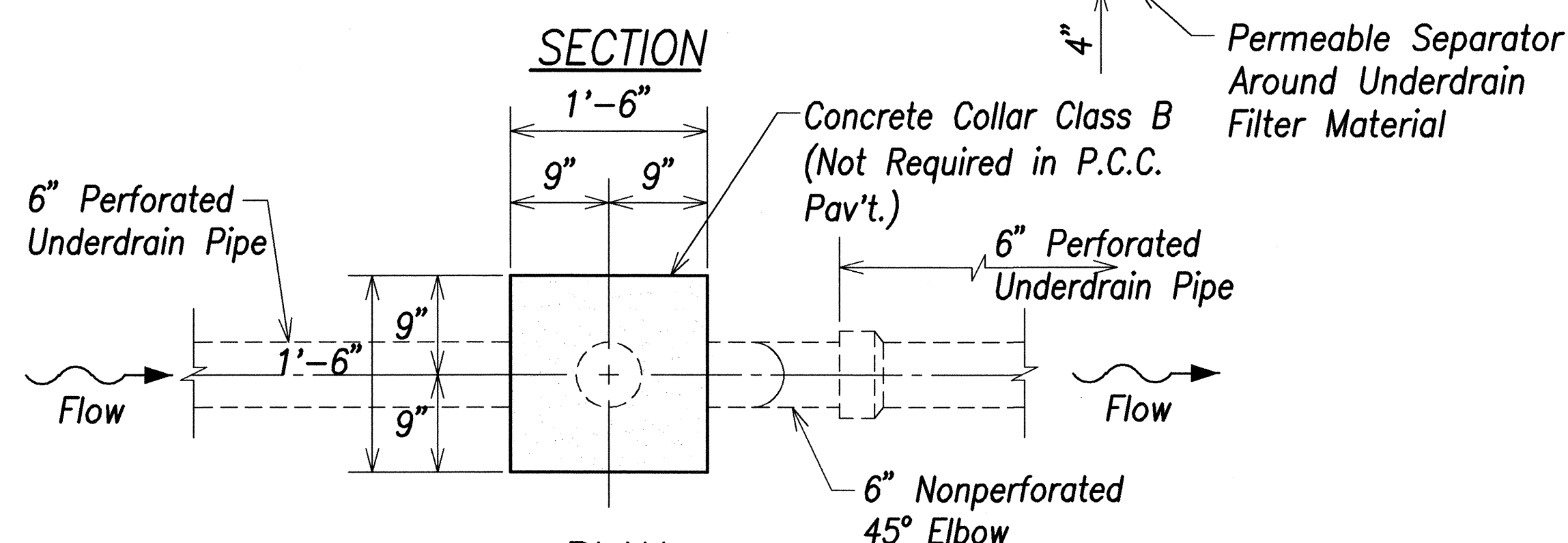
**Notes:**

- 1) For location of Drywell and Underdrain Pipe See Plan Sht. C-18.
- 2) Manhole ring and grated cover, excavation, backfill, and crushed rock shall be incidental to the cost of the drywell.

**DRYWELL**  
Scale: 1"=1'-0"



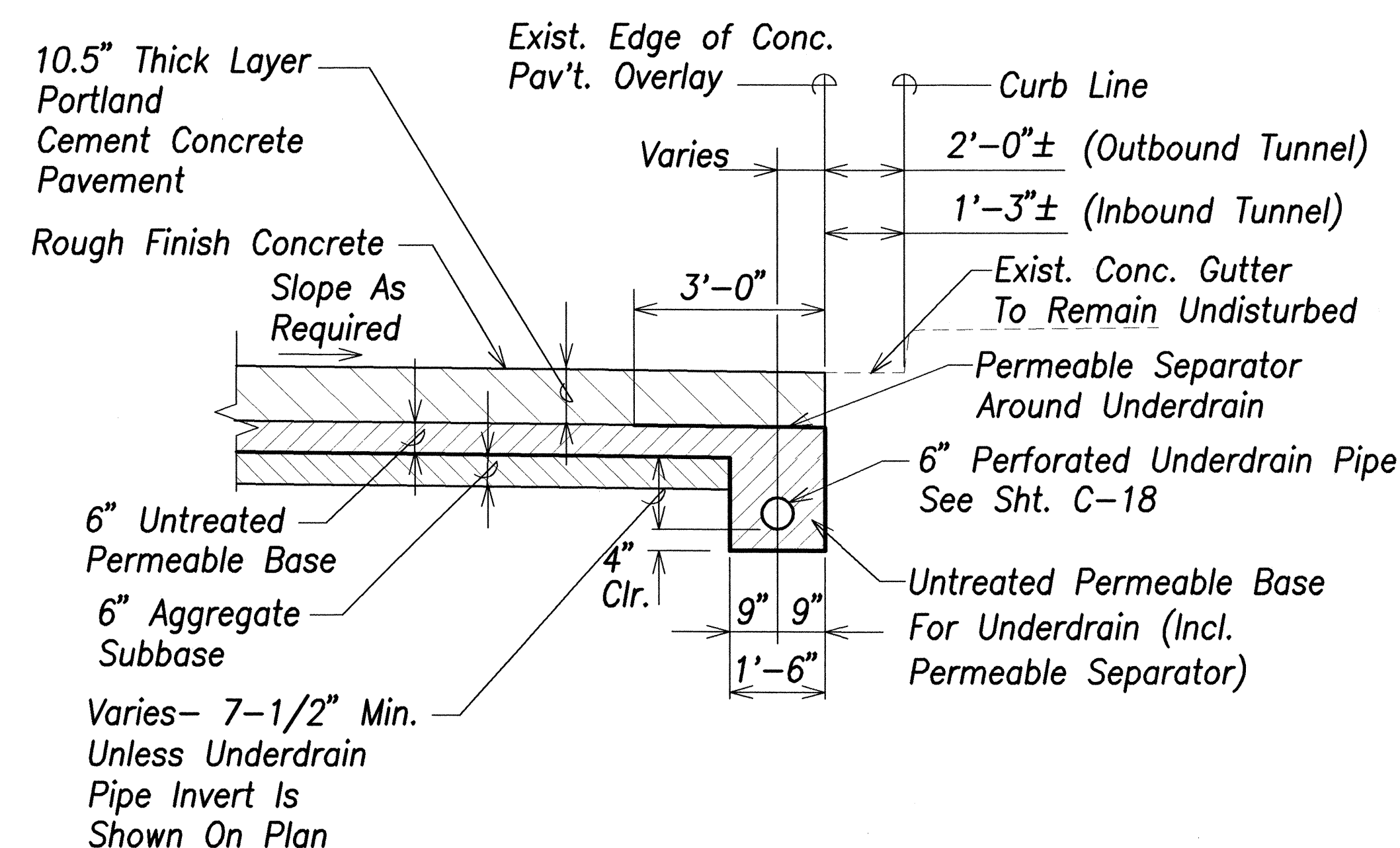
**SECTION**



**PLAN**

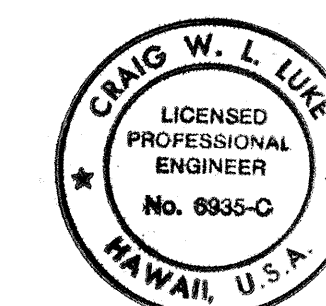
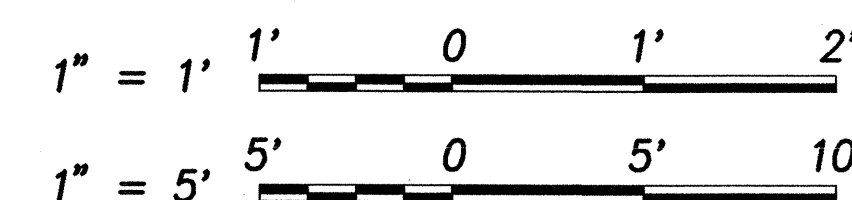
**UNDERDRAIN CLEANOUT**  
Scale: 1"=2'

**UNDERDRAIN CONNECTION TO DRAINAGE STRUCTURE**  
Not to Scale



**UNDERDRAIN DETAIL FOR P.C.C. PAVEMENT**  
Scale: 1/2"=1'-0"

**GRAPHIC SCALES:**



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Signature: [Signature] April 30, 2004  
EXPIRATION DATE OF THE LICENSE

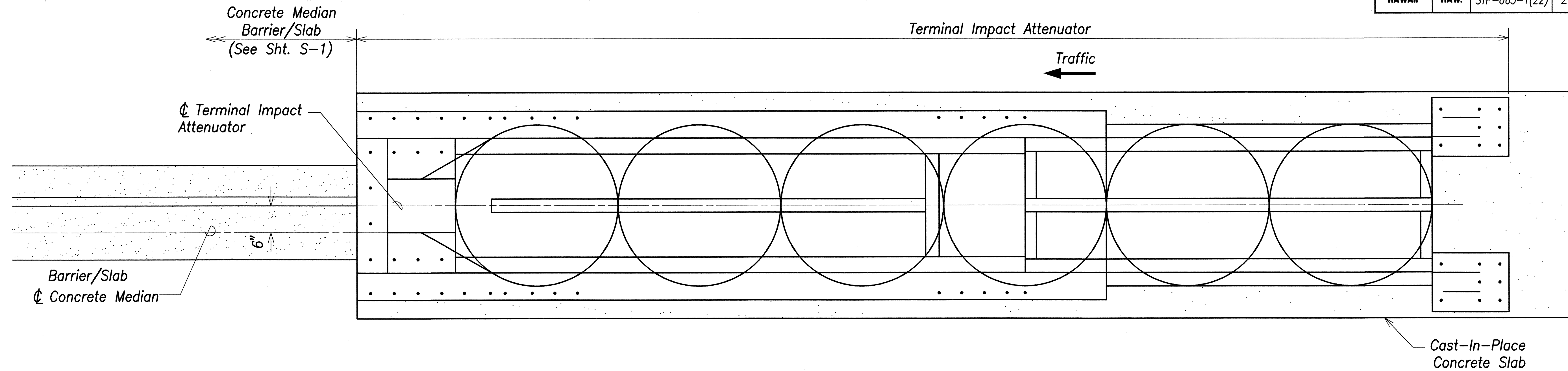
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**UNDERDRAIN DETAILS**

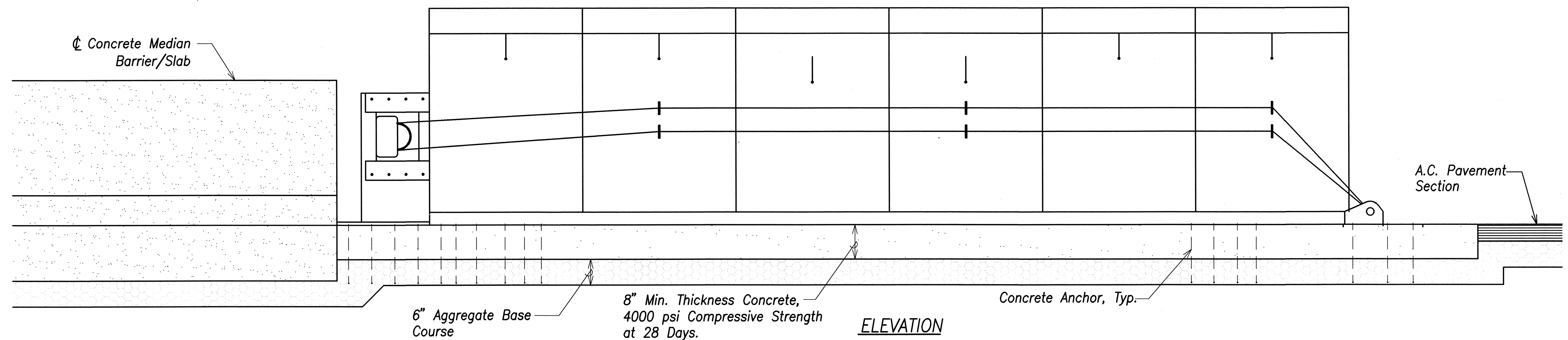
*LIKELIKE HIGHWAY*  
*Wilson Tunnel Improvements*  
*Leak and Crack Remediation*  
F. A. Project No. STP-063-1(22)  
Scale: As Shown Date: April 24, 2003

SHEET No. C-19 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-063-1(22)	2003	21	69



PLAN



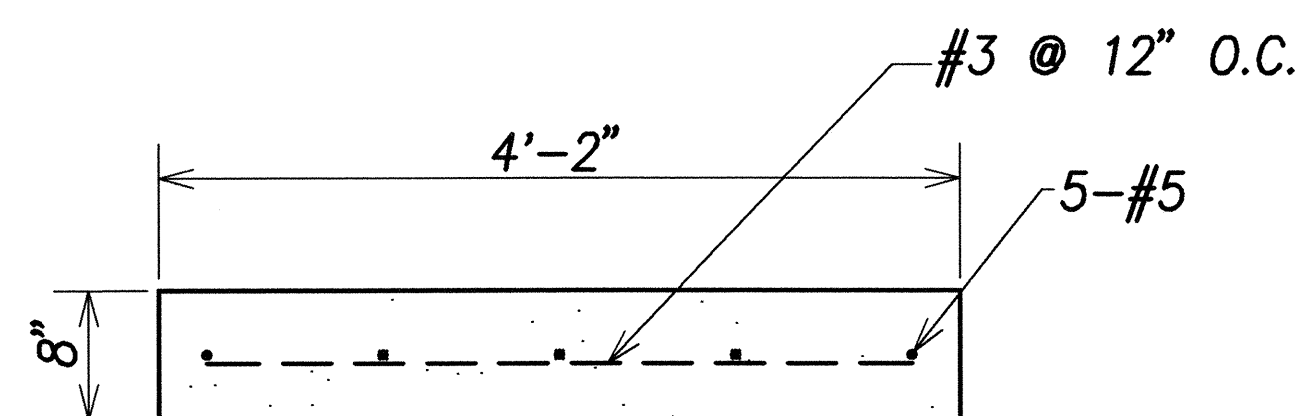
ELEVATION

Notes:

1. Terminal Impact Attenuator Shall Comply with NCHRP Report 350.
2. Contractor Shall Install Terminal Impact Attenuator per Manufacturer's Recommendations.
3. The Soil Bearing Capacity Shall be 3000 psf Minimum (Contractor Shall Verify).

TERMINAL IMPACT ATTENUATOR

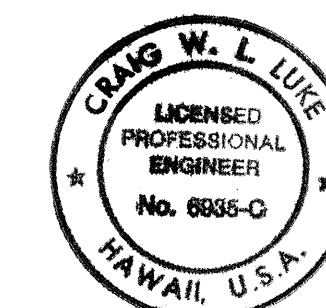
Scale: 1"=1'-0"



CAST-IN-PLACE CONCRETE SLAB

GRAPHIC SCALE

1" = 1'-0" 1' 0 1' 2'



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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**TERMINAL IMPACT ATTENUATOR**

*Likeline Highway*

*Wilson Tunnel Improvements*

*Leak and Crack Remediation*

F. A. Project No. STP-063-1(22)  
Scale: 1" = 1'-0" Date: April 24, 2003

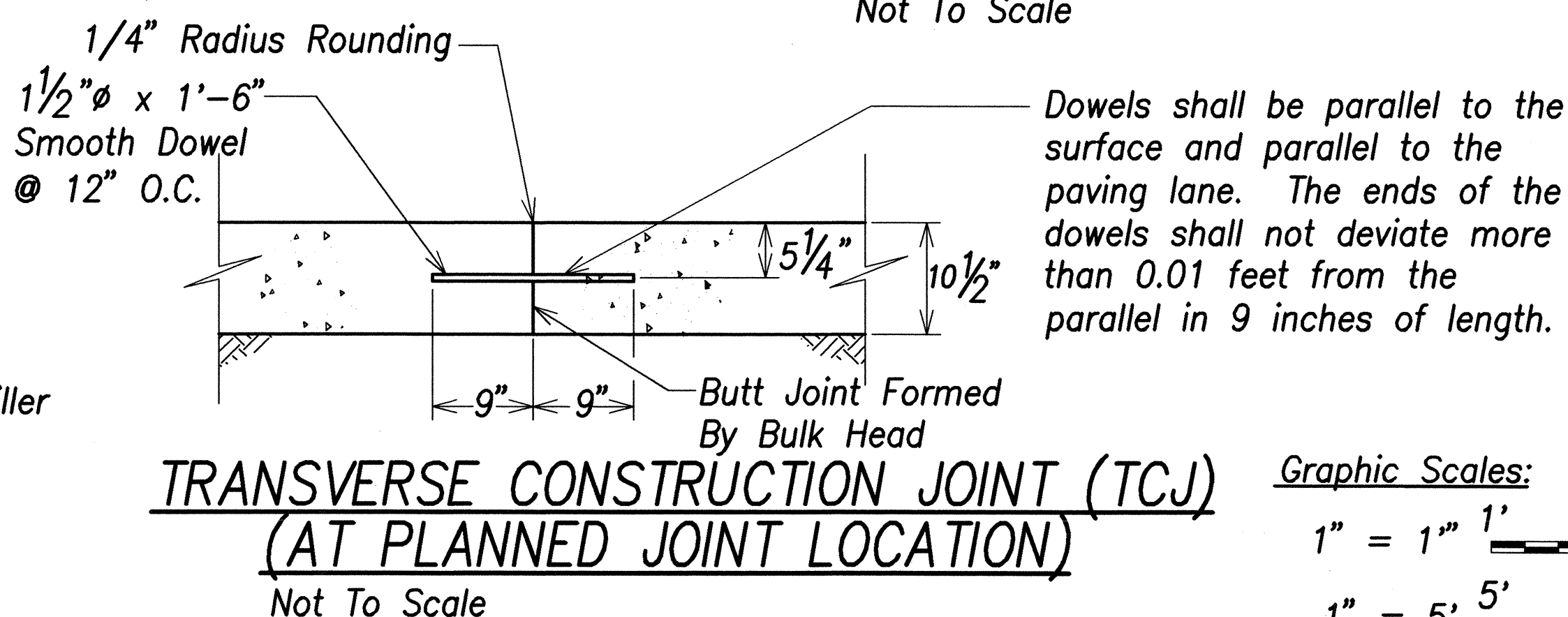
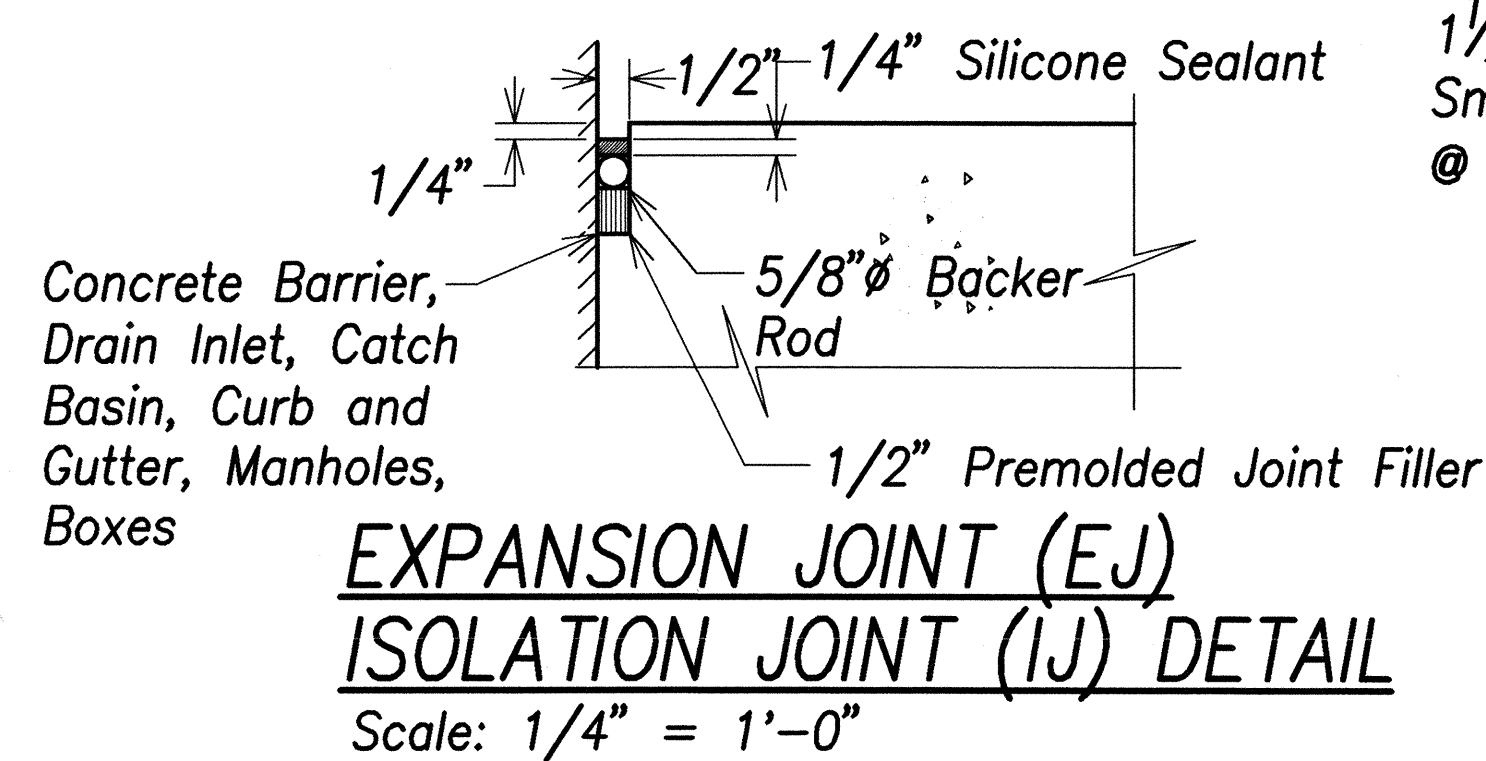
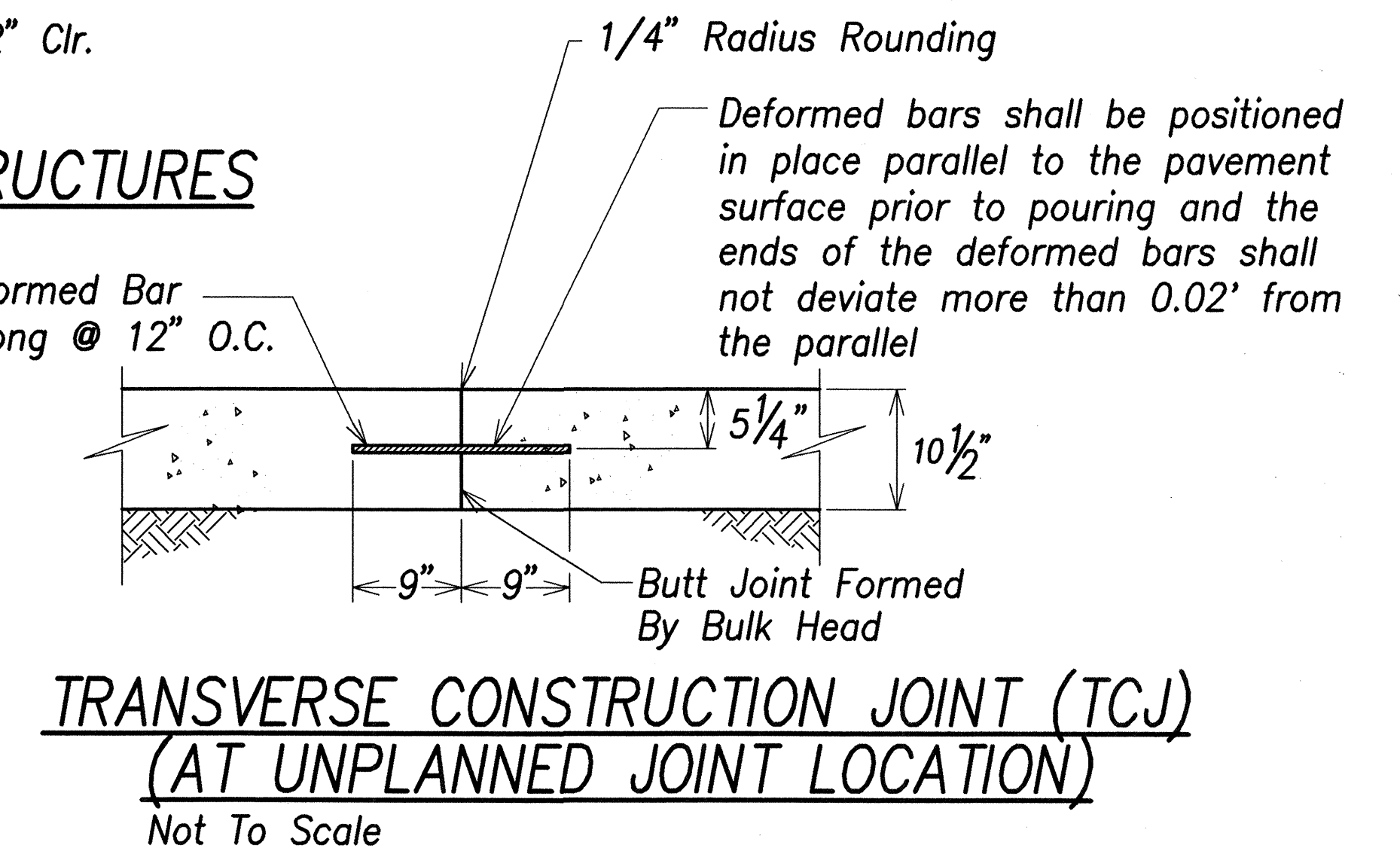
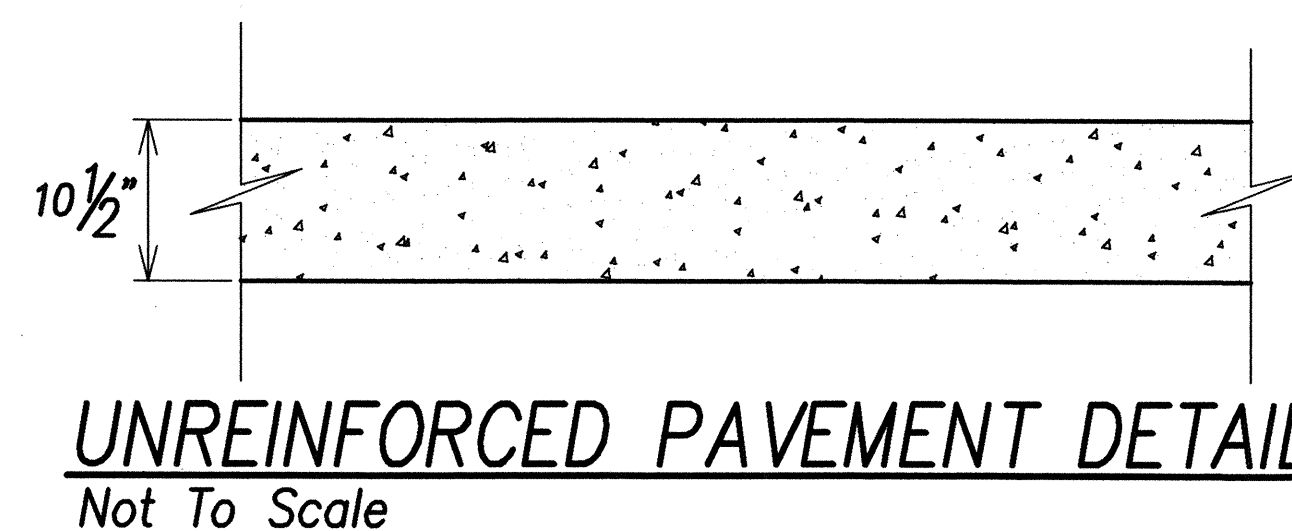
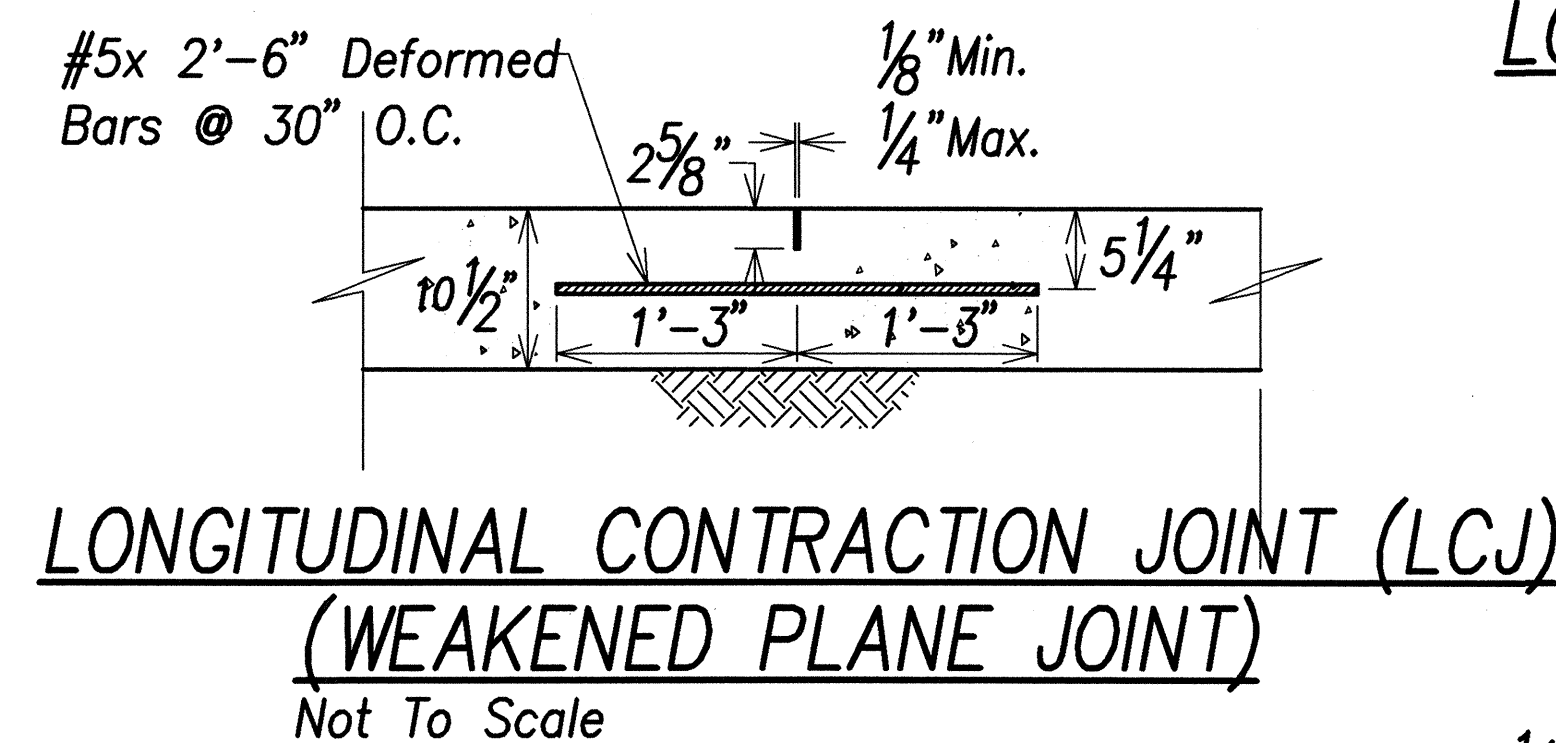
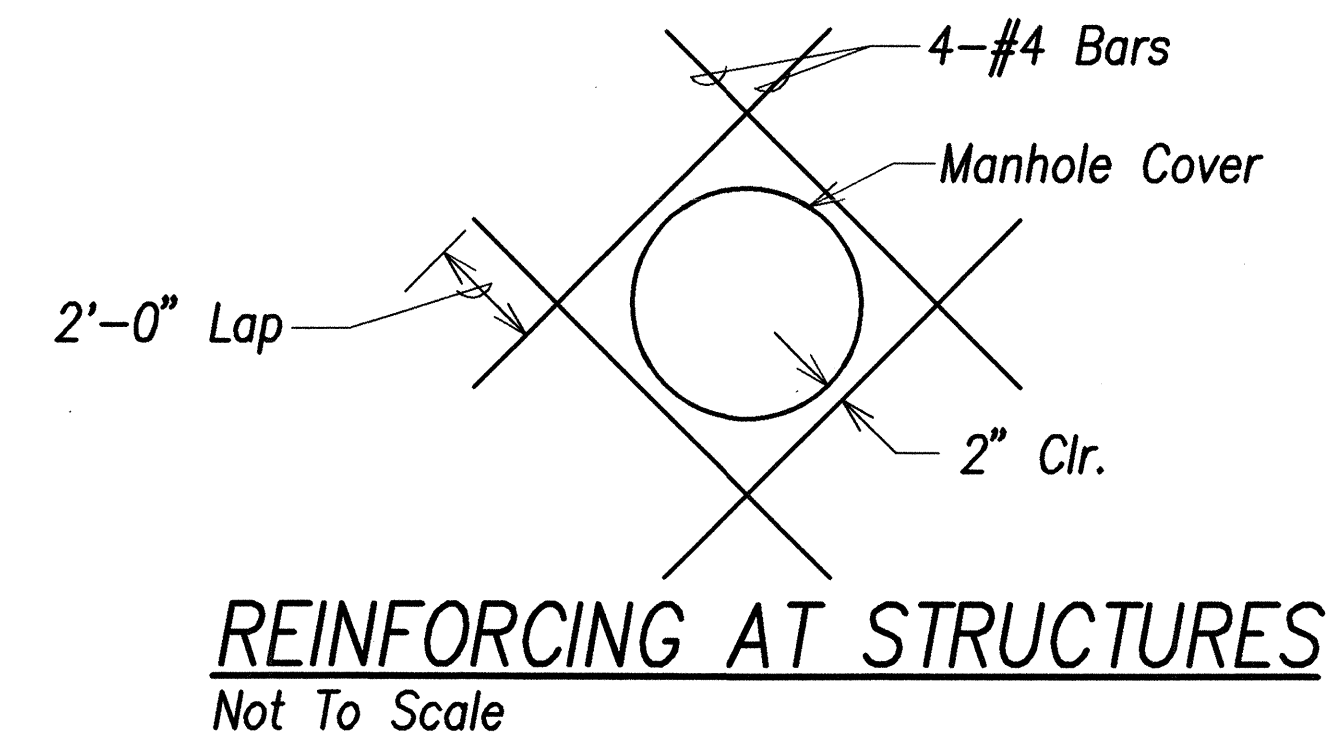
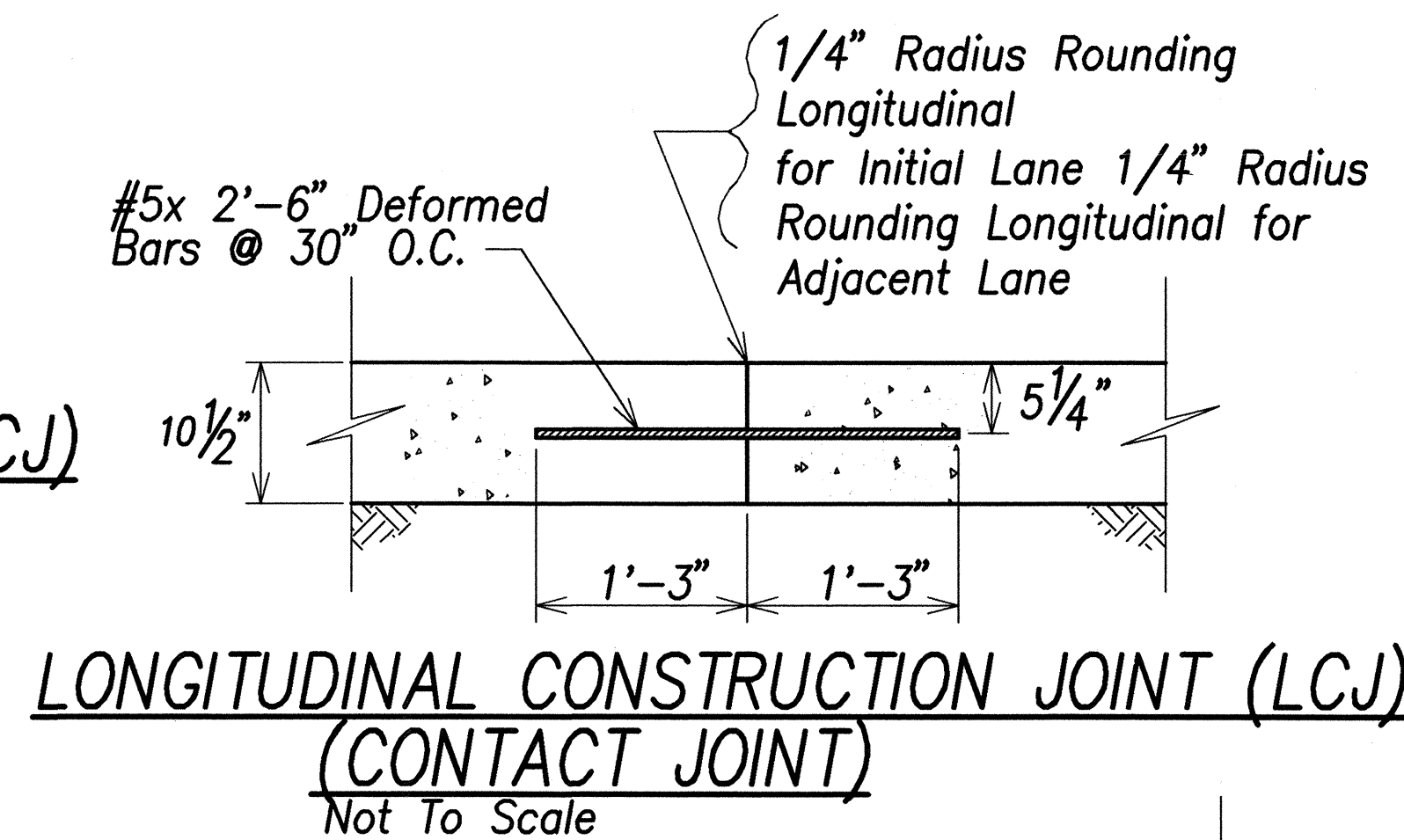
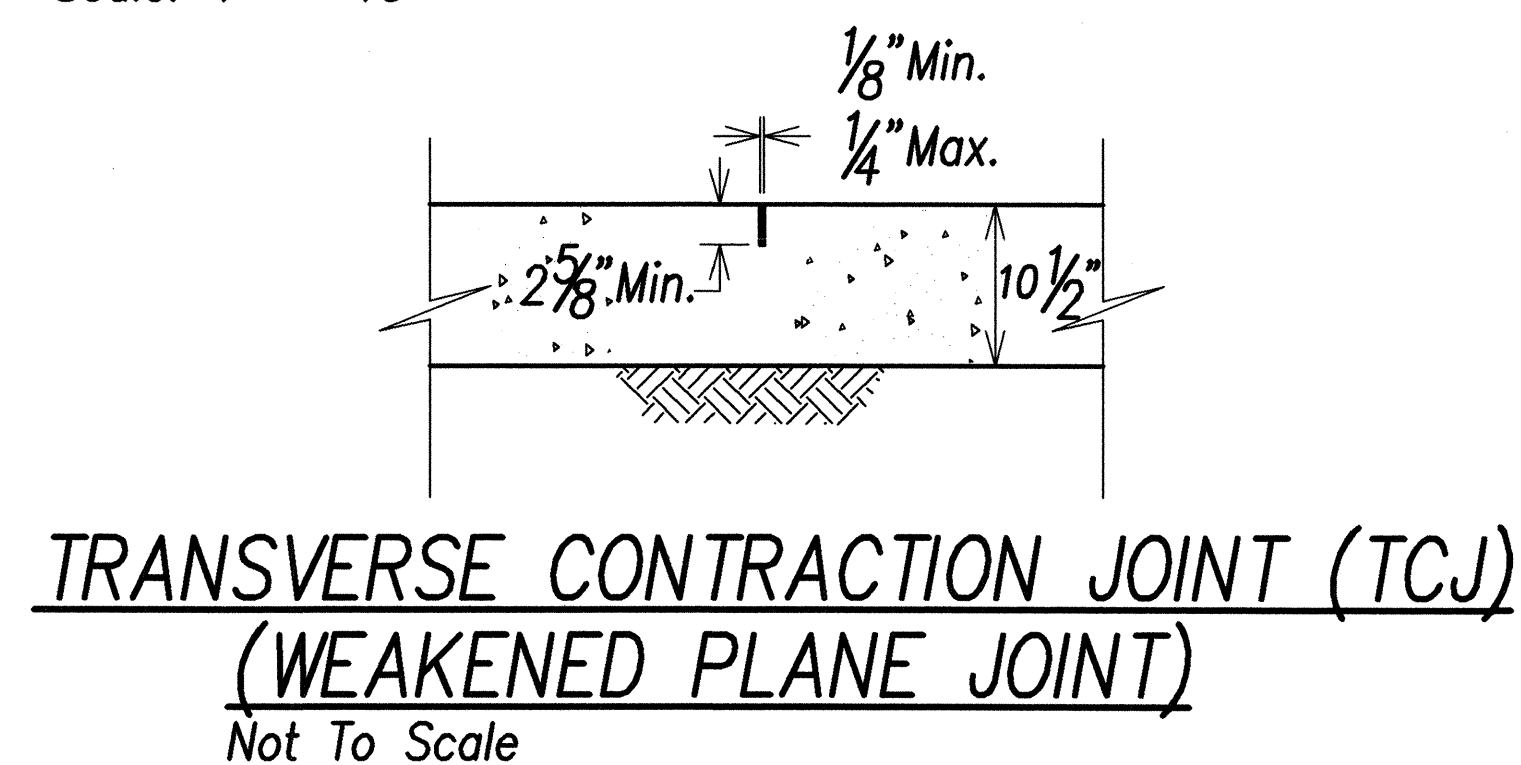
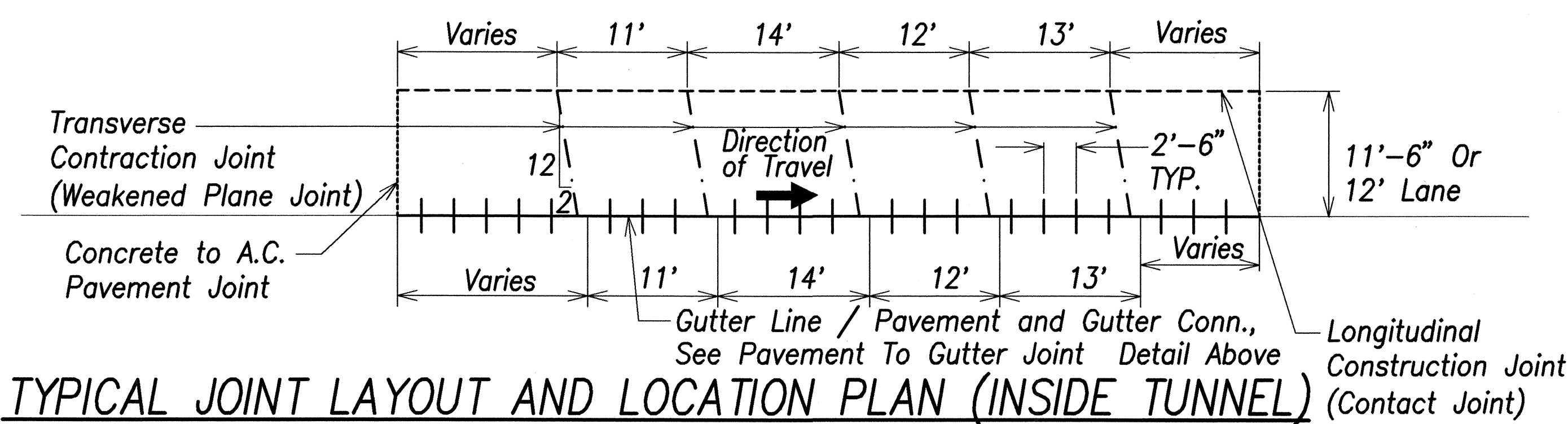
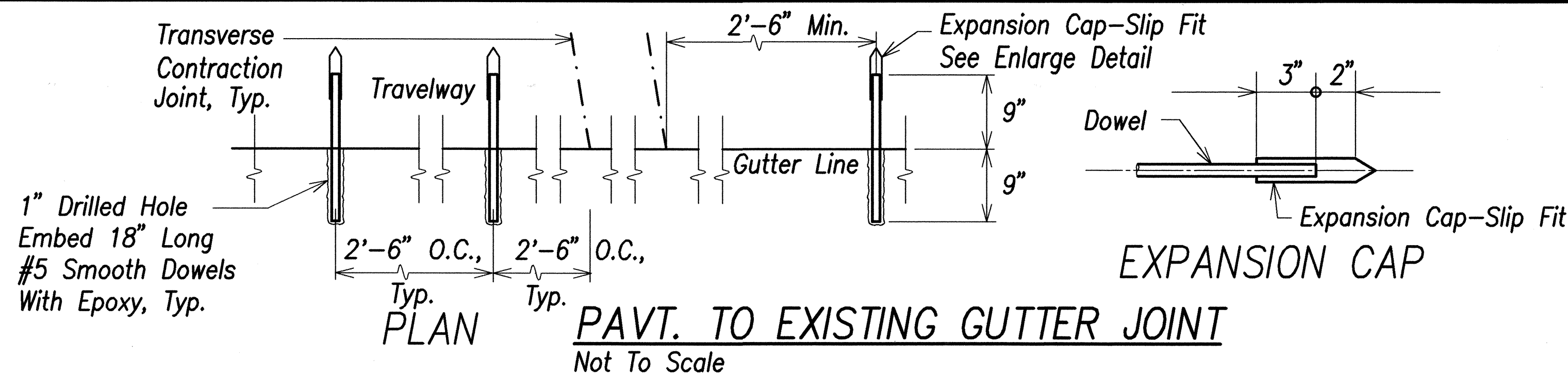
SHEET No. C-20 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-063-1(22)	2003	22	69

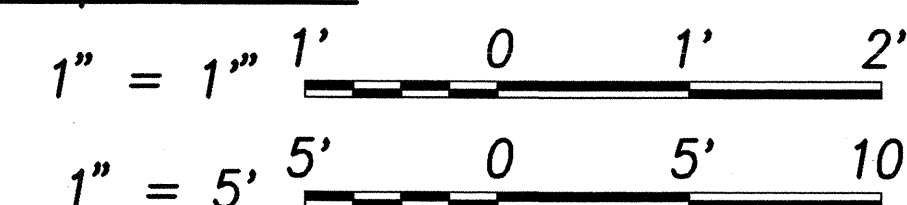
### General Unreinforced Concrete Jointing Notes

1. Transverse contraction joints shall be sawed diagonally as shown, unless otherwise directed by the jointing plans. Under typical conditions, transverse contraction joints shall be skewed counterclockwise with an offset of 2' for every 12' of lane width from the perpendicular to the edge of traveled way.
2. Transverse contraction joints shall be spaced at successive intervals of 11', 14', 12' and 13' in the direction of traffic. Repeat this spacing for the remaining joints.
3. Transverse construction joints shall be located at the nearest planned transverse contraction joint location as shown on the jointing plans.
4. The longitudinal contraction joint detail shall be applicable at the intermediate traffic lane edge when two or more lanes are paved in one continuous pour. The Deformed tie bars shall be placed to the depth as shown On the detail. All other longitudinal joints shall be Constructed in accordance with the longitudinal construction joint (contact joint) detail shown on this plan.
5. At the outer edge of the P.C.C. pavement, 1-1/2" radius rounding shall be utilized longitudinally.

6. All steel shall conform to ASTM A615, grade 60. All steel shall be epoxy coated. All steel that is not completely covered with epoxy coating or with damages epoxy coating shall be replaced at no cost to the state.
7. Dowel baskets shall be anchored to prevent movement during the concrete pour. The contractor shall submit an anchoring plan to the engineer for approval.
8. For travel way lanes, reinforce slab when the ratio of the length of one side of the slab to another side of the slab is greater than 1.25 and less than 0.8, or the slab has unmatched joints, or the slab is triangular in shape, or the slab has at least one side longer than 15 feet.
9. For shoulder, curb and gutter areas tied to the travel lane slab with tie-bars, only triangular shaped slabs need to be reinforced.
10. Contractor shall submit Concrete Pavement Jointing Pattern shop drawing at least 12 weeks prior to concrete pavement work and shall not proceed until written approval from the Engineer is granted.



Graphic Scales:

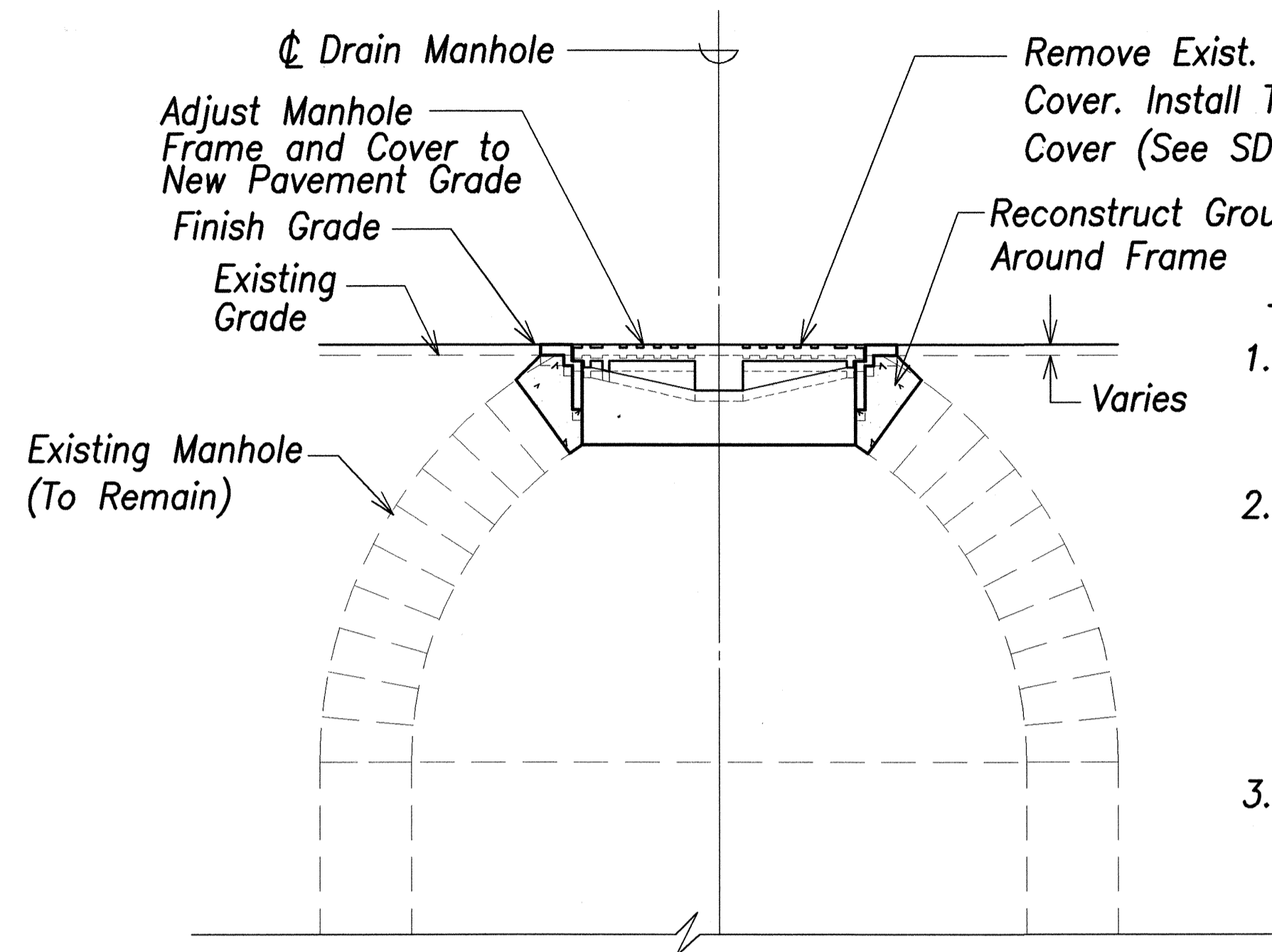


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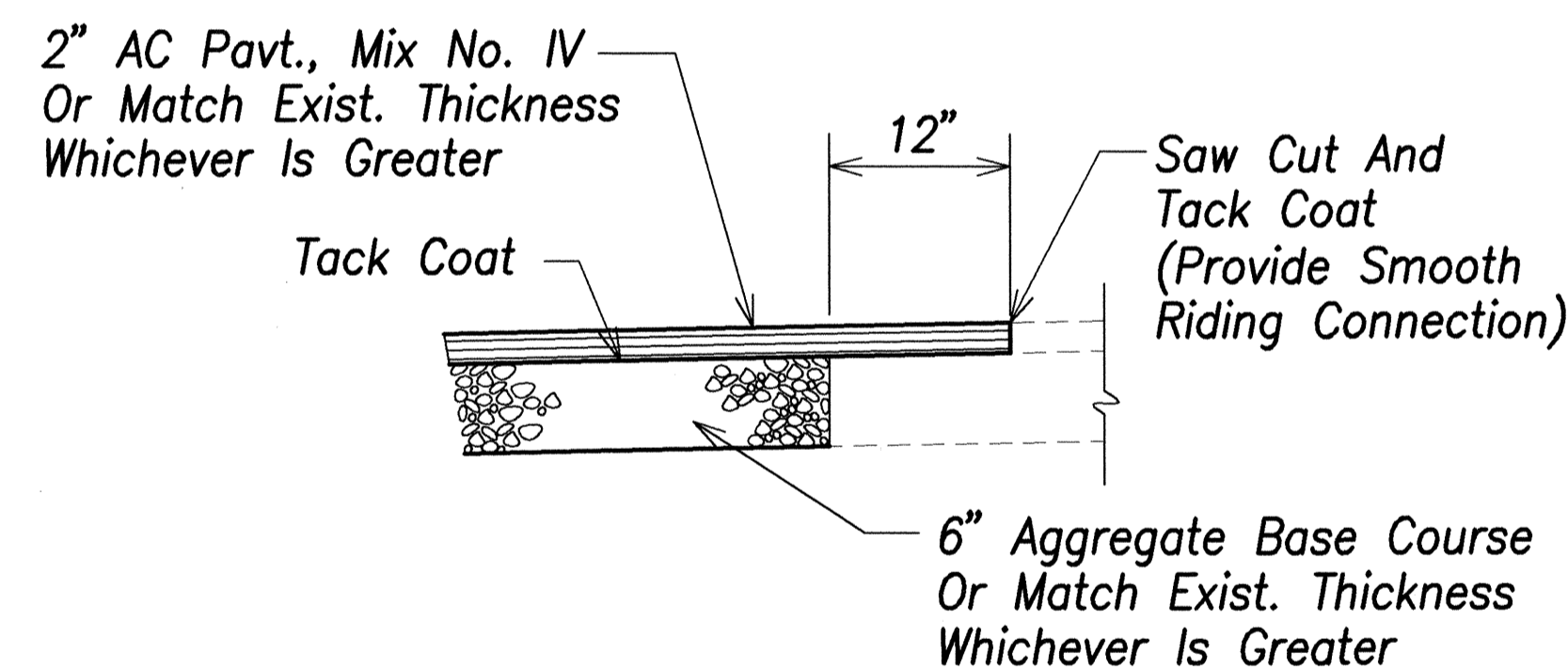
SIGNATURE: [Signature] April 30, 2004 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**UNREINFORCED**  
**CONCRETE PAVEMENT DETAILS**  
LIKELIKE HIGHWAY  
Wilson Tunnel Improvements  
Leak and Crack Remediation  
F. A. Project No. STP-063-1(22)  
Scale: As Shown Date: April 24, 2003  
SHEET No. C-21 OF 30 SHEETS

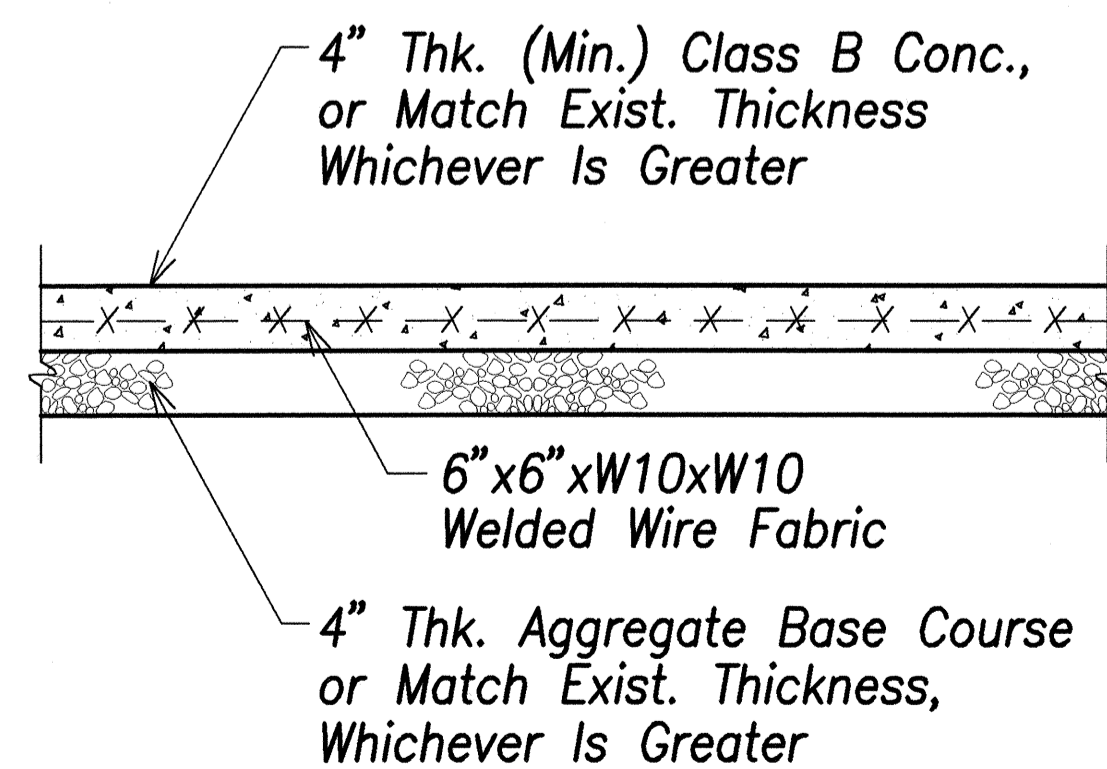
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-063-1(22)	2003	23	69



**DRAIN MANHOLE FRAME AND COVER ADJUSTMENT**  
Scale: 1" = 1'-0"



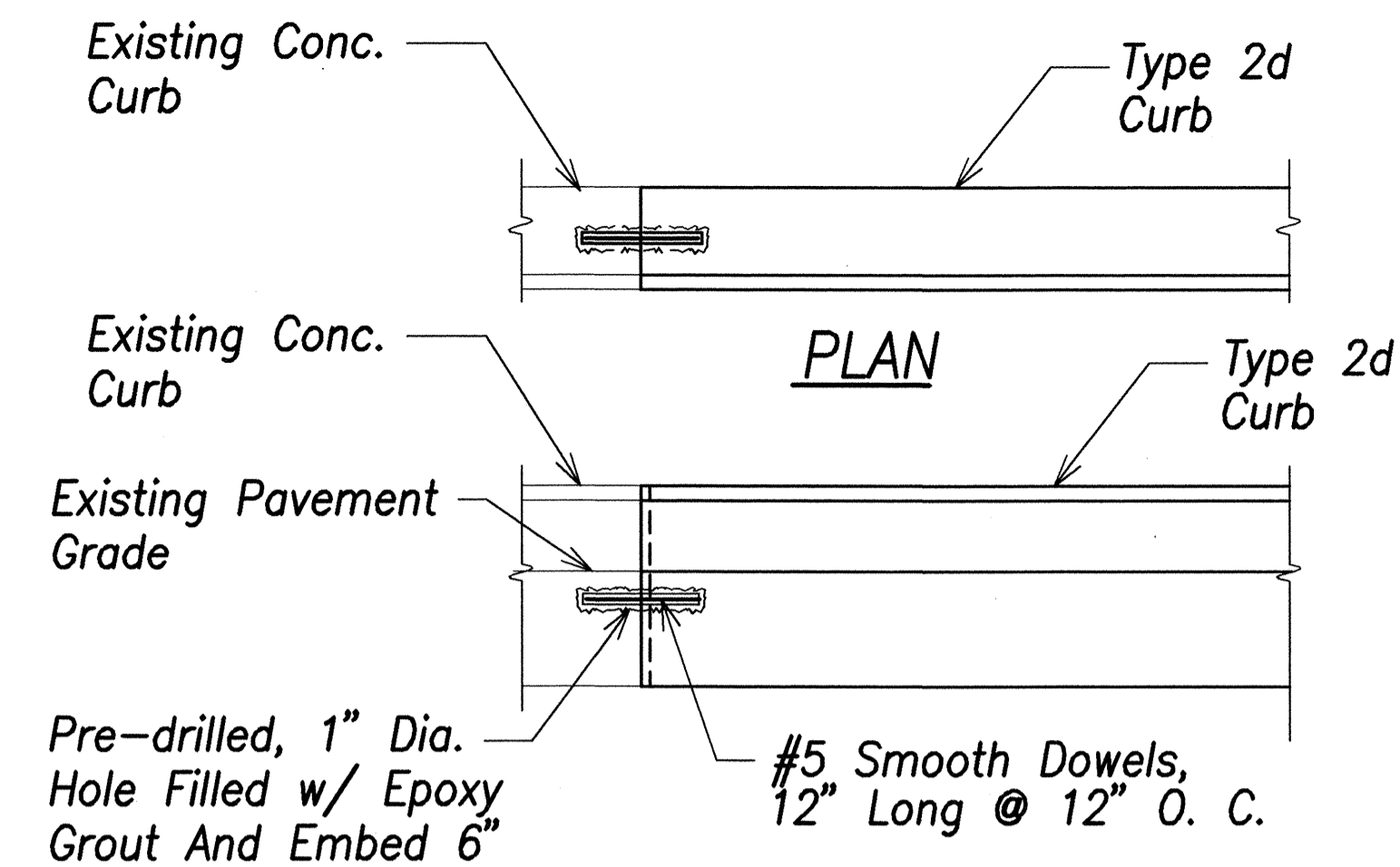
**PAVEMENT CONNECTION**  
Scale: 1" = 1'-0"



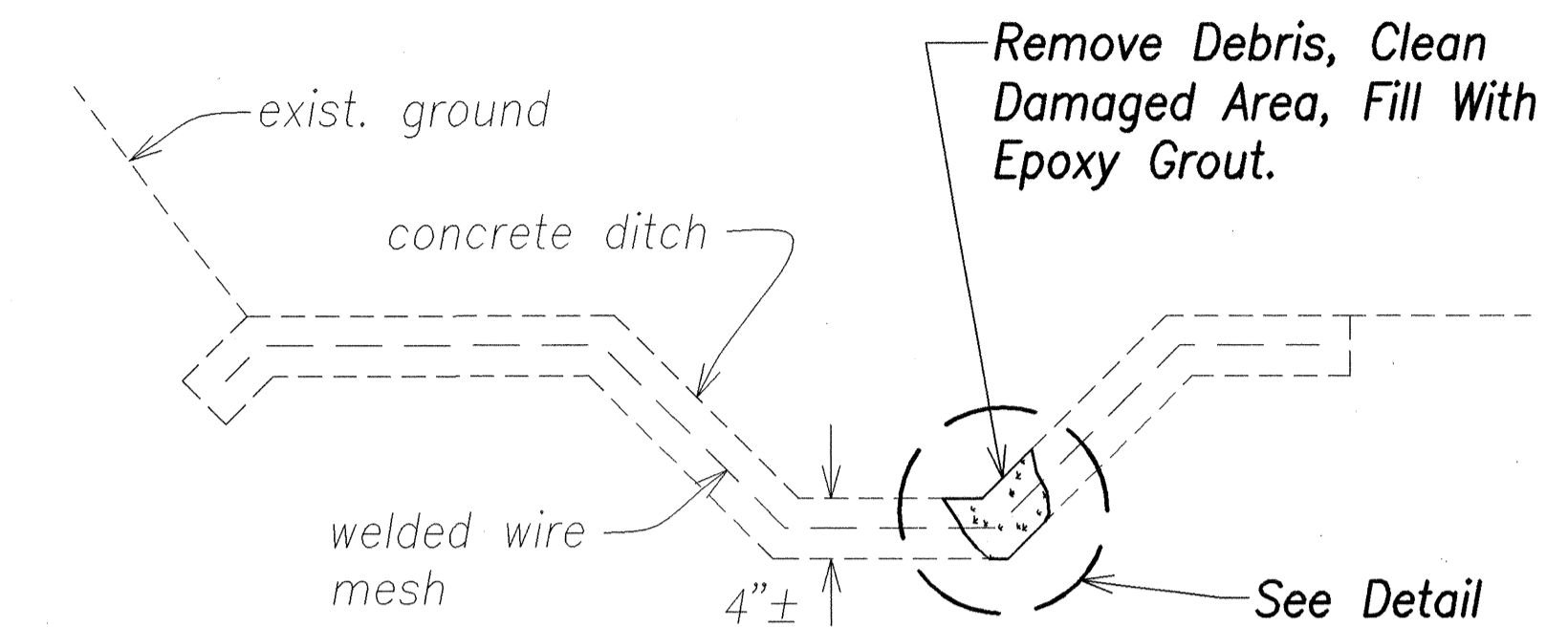
**CONCRETE SIDEWALK**  
Scale: 1" = 1'-0"

**Notes:**

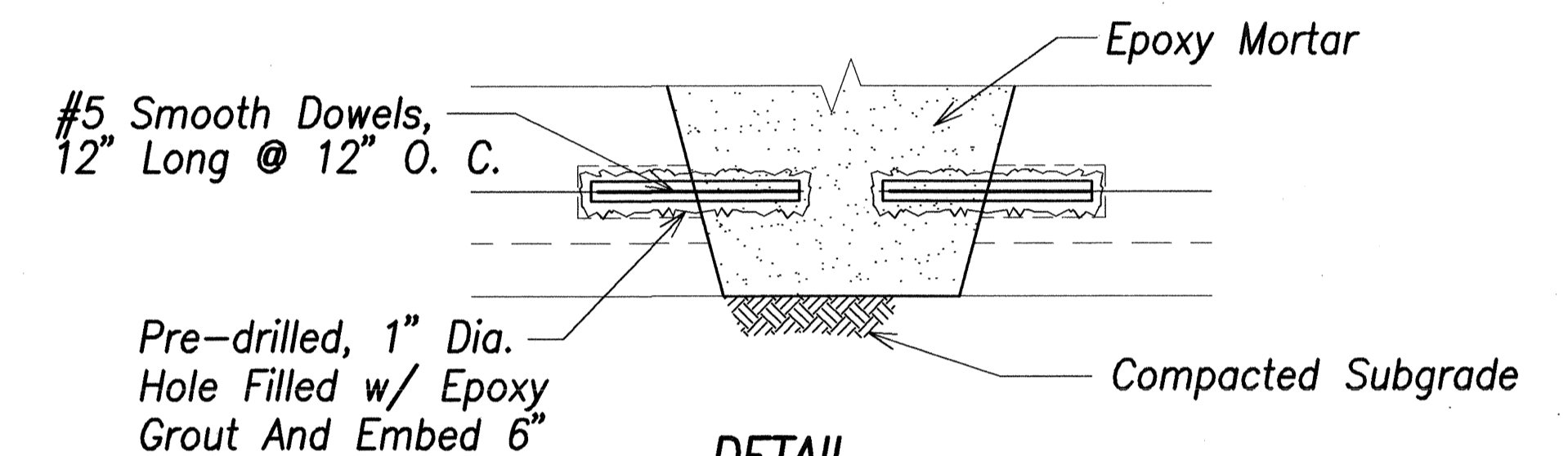
- Existing drain manhole covers are welded to the frame.
- The Contractor shall weld manhole cover to the frame after manhole top adjustment. Weld shall be around entire circumference of manhole cover or as directed by the Engineer.
- See sheet C-21 for reinforcing at structures details.



**ELEVATION CONCRETE CURB CONNECTION**  
Scale: 1" = 1'-0"



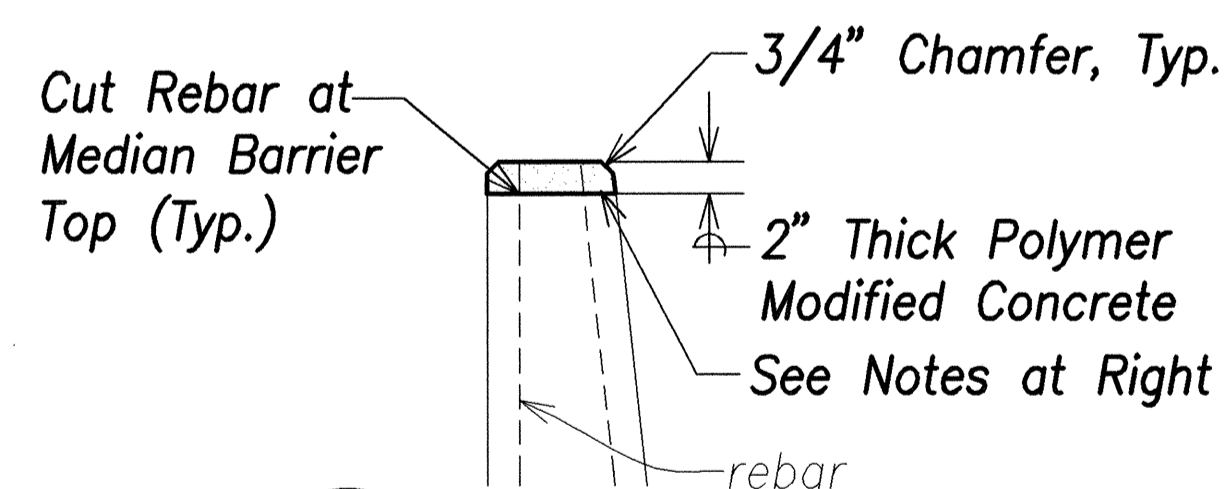
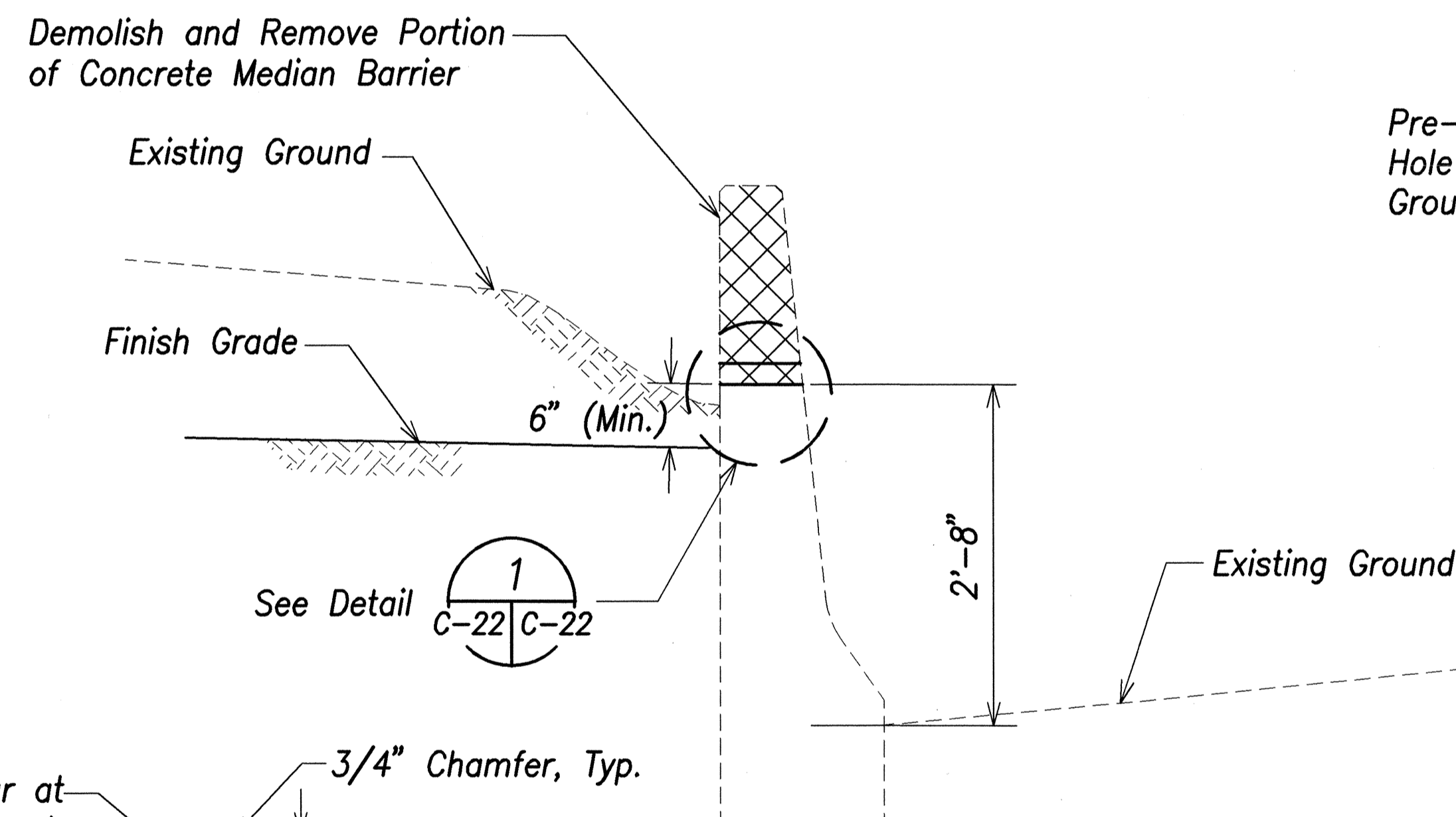
**CONCRETE DITCH REPAIR**  
Scale: 1" = 1'-0"



**DETAIL**  
Not To Scale

**Notes:**

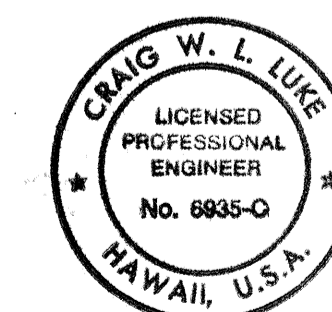
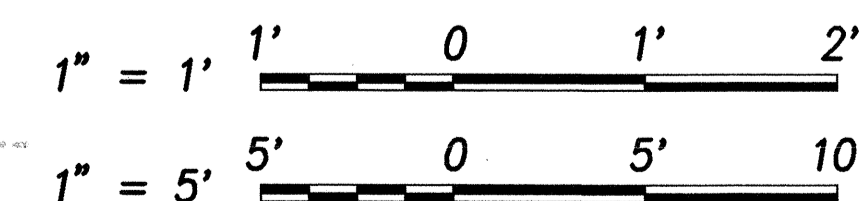
- Clean and prepare surface by high pressure water blast to clean and obtain an aggregate-fractured surface with a minimum surface profile of 1/4 inch.
- Mechanically clean exposed reinforcing steel to remove all traces of rust.
- Apply cement slurry, scrubbing slurry into voids. Cure according to manufacturer's recommendations.
- Maximum lift shall not exceed 2 inches for a single lift.



**DETAIL**  
C-22 C-22

**MEDIAN BARRIER MODIFICATION**  
Scale: 1" = 1'-0"

**GRAPHIC SCALES:**



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STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**MISCELLANEOUS DETAILS**

**LIKELIKE HIGHWAY**

**Wilson Tunnel Improvements**

**Leak and Crack Remediation**

**F. A. Project No. STP-063-1(22)**

Scale: As Shown Date: April 24, 2003

**SHEET No. C-22 OF 30 SHEETS**